



INSTRUMENTAÇÃO: CORDAS

MARCOS FILHO

A FAMÍLIA DAS CORDAS



Violino



Viola



Violoncelo



Contrabaixo

Características gerais

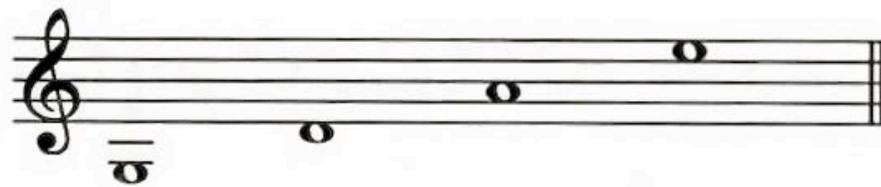
- Possui uma enorme extensão abrangendo sete oitavas entre os contrabaixos e violinos;
- Possui timbre homogêneo em toda sua extensão com apenas poucas variações em registros diferentes;
- Faixa dinâmica bem equilibrada permitindo *pianissimos* e *fortissimos* efetivos;
- Sonoridade versátil: produz diferentes tipos de sons (com arco, pizzicato, efeitos) além de executar, sem maiores problemas, passagens rápidas, notas longas, trinados, notas duplas;



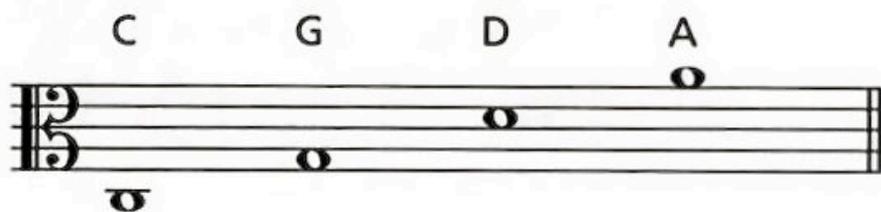
No violoncelo o apoio é no espigão.

Nomenclatura do Violino

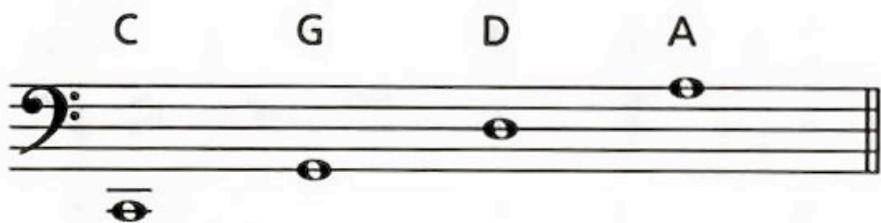




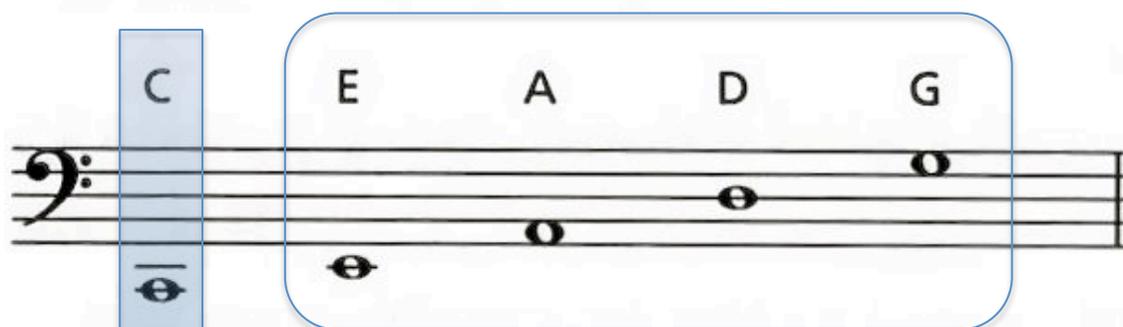
Violino



Viola



Violoncelo



Contrabaixo

(nos baixos especiais de cinco cordas acrescenta-se a corda Dó)

TESSITURA BÁSICA

The image displays a musical score for four string instruments: Violin, Viola, Cello, and Contrabass. A vertical dashed line marks the position of 'MIDDLE C' (C4). The Violin staff is in treble clef, Viola in alto clef, Cello in bass clef, and Contrabass in bass clef. The Violin part shows a range from approximately G4 to G6, with the upper portion labeled 'NOT PRACTICAL' and 'SVA'. The Viola part ranges from approximately G3 to G5. The Cello part ranges from approximately G2 to G4, with a blue box highlighting a section between G3 and G4. The Contrabass part ranges from approximately G1 to G3. A blue box highlights the beginning of the Violin staff.

DISTRIBUIÇÃO E EQUILÍBRIO DAS CORDAS

GRANDE ORQUESTRA

Primeiros violinos	16 a 18 músicos	8 ou 9 estantes
Segundos violinos	14 a 16 músicos	7 ou 8 estantes
Violas	10 a 12 músicos	5 ou 6 estantes
Cellos	10 a 12 músicos	5 ou 6 estantes
Contrabaixos	8 a 10 músicos	4 ou 5 estantes

OUTRAS CONFIGURAÇÕES EQUILIBRADAS

6 violinos	9 violinos	12 violinos	18 violinos
2 violas	3 violas	4 violas	6 violas
2 celli	3 celli	4 celli	6 celli

EXAMPLE 2-11. Debussy, *Nocturnes*, "Nuages," mm. 7-15 (strings only)



7 **Modéré**

The score is for strings only, measures 7-15. It includes staves for Timpani (Timp.), Violin 1 (Vln. 1), Violin 2 (Vln. 2), Viola (Vla.), Violoncello (Vlc.), and Double Bass (D.B.). The key signature is two sharps (F# and C#) and the time signature is 6/4. The tempo is marked 'Modéré'. The score shows a progression of chords and textures. In measures 7-8, the Violin 1 part has a 'Div. a 6' marking and a 'pp' dynamic. In measure 9, the Violin 2 part has a 'pp' dynamic. In measure 10, there is a 'pp' dynamic. In measure 11, there is a 'pp' dynamic. In measure 12, there is a 'pp' dynamic. In measure 13, there is a 'pp' dynamic. In measure 14, there is a 'pp' dynamic. In measure 15, there is a 'pp' dynamic. The score also includes markings for '8va' (8va) and 'a 3' (a 3).

DIVISI

12

Vln. 1

Vln. 2

Vla.

Vlc.

D.B.

pp

pp

pp

pp

pp

pp

pizz.

pp

a 2

a 3

a 2

a 2

a 2

EXAMPLE 2-13. R. Strauss, *Also sprach Zarathustra*, at 27

Like a dance

(with expression)

Violin 1 (Vln. 1): 1st stand (div.), 2nd stand (div.), 4th stand. Includes performance instructions: *div.*, *p*, *pp*, *f*, *glissando*.

Violin 2 (Vln. 2): 1st stand (div.), 2nd stand (div.), 4th stand. Includes performance instructions: *p*, *pp*, *f*.

Viola (Vla.): 1st stand (div.), 2nd stand (div.), 4th stand. Includes performance instructions: *p*, *pp*, *f*, *Solo*.

Violins 2, 3, 4, 5 stands: Includes performance instructions: *pp*, *glissando*.

Violin 1 (Vln. 1): Includes performance instructions: *f*, *pp*, *A str.*



VIBRATO

A grande maioria dos músicos utilizam o *vibrato* automaticamente para realçar a sustentação das notas.

Quando o arranjador ou orquestrador não quer a utilização do *vibrato* deve-se escrever acima da passagem: *non vibrato* ou *senza vibrato*.

GLISSANDO E PORTAMENTO



EXAMPLE 2-14. Ravel, *La Valse*, at 30

Mouvement de valse viennoise

sur Sol.....

Vln. 1

mf espressif

EXAMPLE 2-15. Bartók, *Music for Strings, Percussion and Celesta*, second movement, 1 m. before 170

$\text{♩} = 138$

Vln. 1

pizz. *mf* arco *f* III* pizz. *mf* arco *f* pizz. *p*

*to be played on the third, the D, string.



NON LEGATO

EXAMPLE 2-18. Elgar, *Pomp and Circumstance* No. 1, trio



Molto maestoso

Vln. 1

Talão



Ponta



Crina

LEGATO



EXAMPLE 2-19. Schubert, Symphony No. 5, second movement, mm. 1-8



Andante con moto

Vln. 1

Vln. 2

Vla.

Vcl. D.B.

Vln. 1

Vln. 2

Vla.

Vcl. D.B.

EXAMPLE 2-20. Beethoven, *Coriolanus* Overture, mm. 276–286

Allegro

276

Vln. 1

Vln. 2



EXAMPLE 2-21. Mendelssohn, Symphony No. 4, first movement, mm. 378–388

Allegro

378

Vln. 1

p

Vln. 2

383

Vln. 1

Vln. 2

pp

EXAMPLE 2-22. Mendelssohn, Symphony No. 4, first movement, mm. 461–464

Allegro

461

Vla.

f

cresc.

EXAMPLE 2-23. Liszt, *Les Preludes*, mm. 30–34

Adagio

31

Vln. 1

Vln. 2

Vla.

Vlc.

D.B.

f

EXAMPLE 2-24. Liszt, *Les Preludes*, mm. 30–34, possible bowing

più cresc. *f*

EXAMPLE 2-25. Liszt, *Les Preludes*, mm. 30–34, possible bowing

half the players

più cresc. *f*

half the players



EXAMPLE 2-26. Tchaikovsky, *Romeo and Juliet*, mm. 141–143

Allegro giusto 142

Vln. 1
f cresc.

Vln. 2
f cresc.

Vla.
f cresc.

Vlc.
f cresc.

D.B.
f cresc.



EXAMPLE 2-27. Bartók, *Concerto for Orchestra*, fifth movement, mm. 8–13

8 **Allegro con fuoco**

Vln. 2 Div.

punta d'arco

pp

11

punta d'arco

pp



EXAMPLE 2-28. Gluck, *Iphigenia in Aulis*, Overture, mm. 19–29

Andante

20
au talon *ten.* *ten.*

Vln. 1
ff *sf ten.* *sf ten.* *sf*

Vln. 2
ff *sf ten.* *sf ten.* *sf*

Vla.
ff *sf ten.* *sf ten.* *sf*

Vcl. D.B.
ff *sf* *sf* *sf*

25 *ten.*

Vln. 1
sf *sf ten.* *ff*

Vln. 2
sf *sf ten.* *ff*

Vla.
sf *sf ten.* *ff*

Vcl. D.B.
sf *sf* *ff*



EXAMPLE 2-29. Tchaikovsky, Symphony No. 6, third movement, mm. 108–112

Allegro molto vivace

109

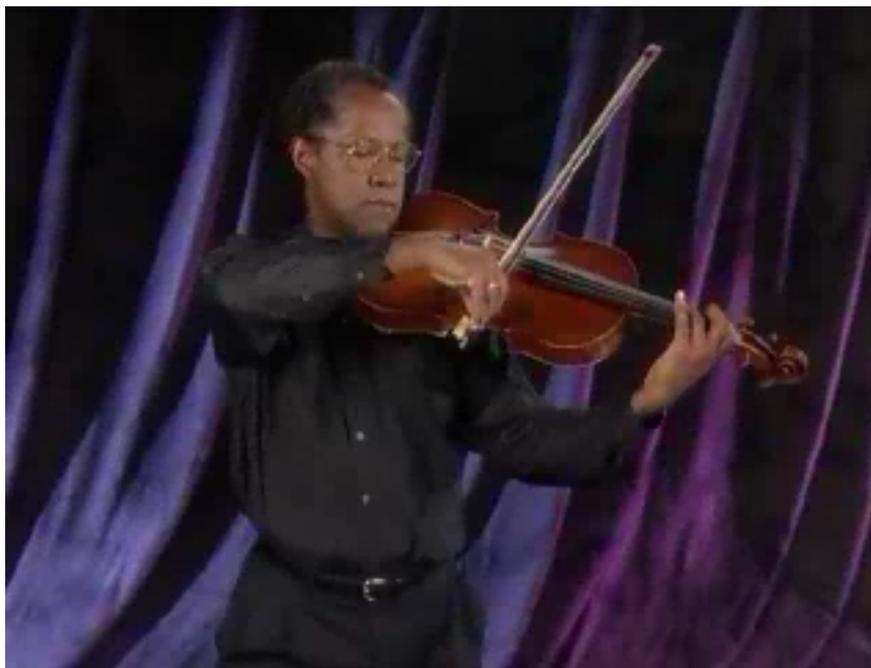
Vln. 1
Vln. 2
Vla.
Vlc.
D.B.

ff
ff
pp
pp
ff



LOURÉ

É uma arcada *legato* tocada a partir de sutis separações entre as notas. Pode produzir um efeito muito expressivo e é comum também em acompanhamentos. É indicada pelo símbolo de tenuto adicionado embaixo da cabeça das notas e delimitado pelas ligaduras (separando entre talão e ponta).



EXAMPLE 2-30. Handel, *Messiah*, "Comfort Ye," mm. 1–4 (tenor part not recorded on CD)

Larghetto

1

Vln. 1 *p* *sim.*

Vln. 2 *p* *sim.*

Vla. *p* *sim.*

Tenor

Vlc. D.B. *p*

6 4 3 6 6 6 4 5

Com-fort ye!



STACCATO

Vln. Moderato

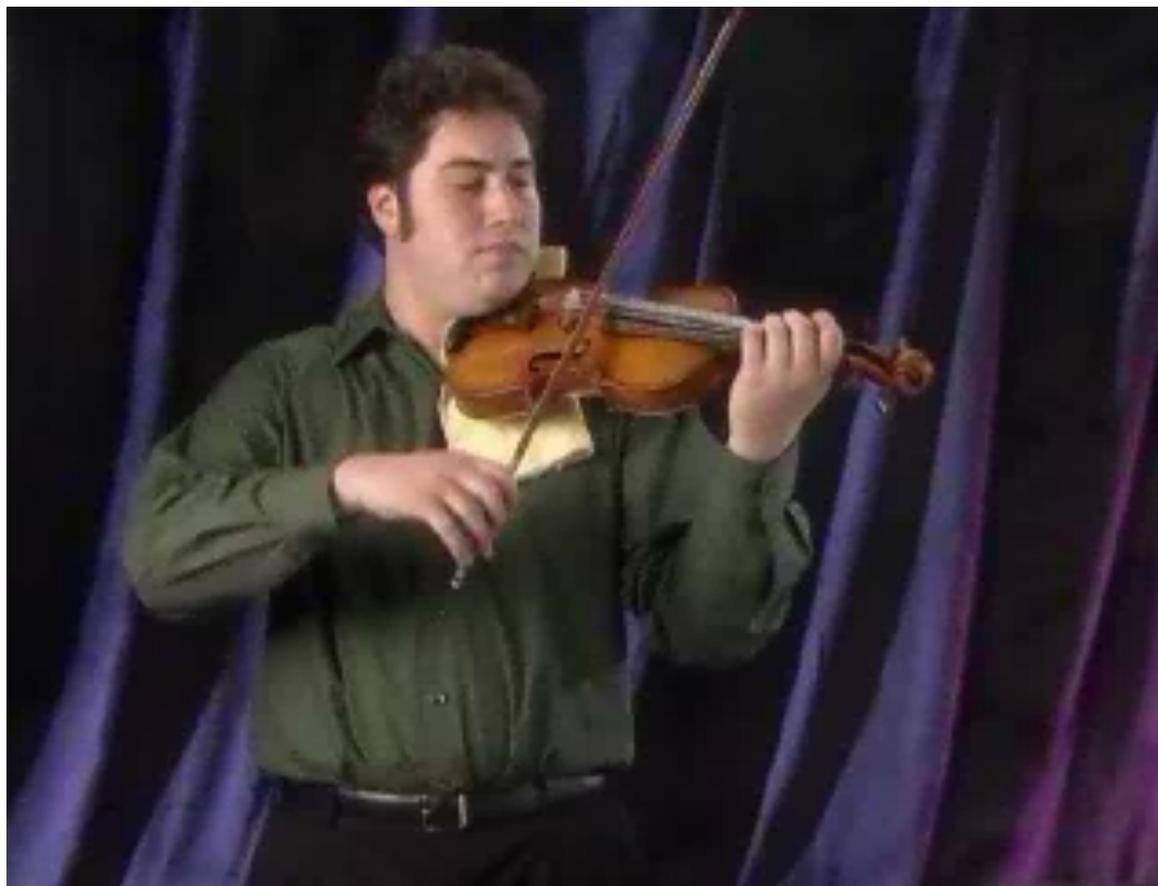
ff *pp*

Detailed description: This musical notation is for a violin part in 4/4 time, marked Moderato. It consists of a single staff with a treble clef. The piece begins with a forte (*ff*) dynamic. The first measure contains four quarter notes: G4, A4, B4, and C5. The second measure contains a descending eighth-note pair (B4, A4), followed by a quarter note (G4) and a quarter rest. The third measure contains four quarter notes: G4, F4, E4, and D4. The fourth measure contains a descending eighth-note pair (D4, C4), followed by a quarter note (B3) and a quarter rest. The piece concludes with a piano (*pp*) dynamic.

Vln. Moderato

ff *pp*

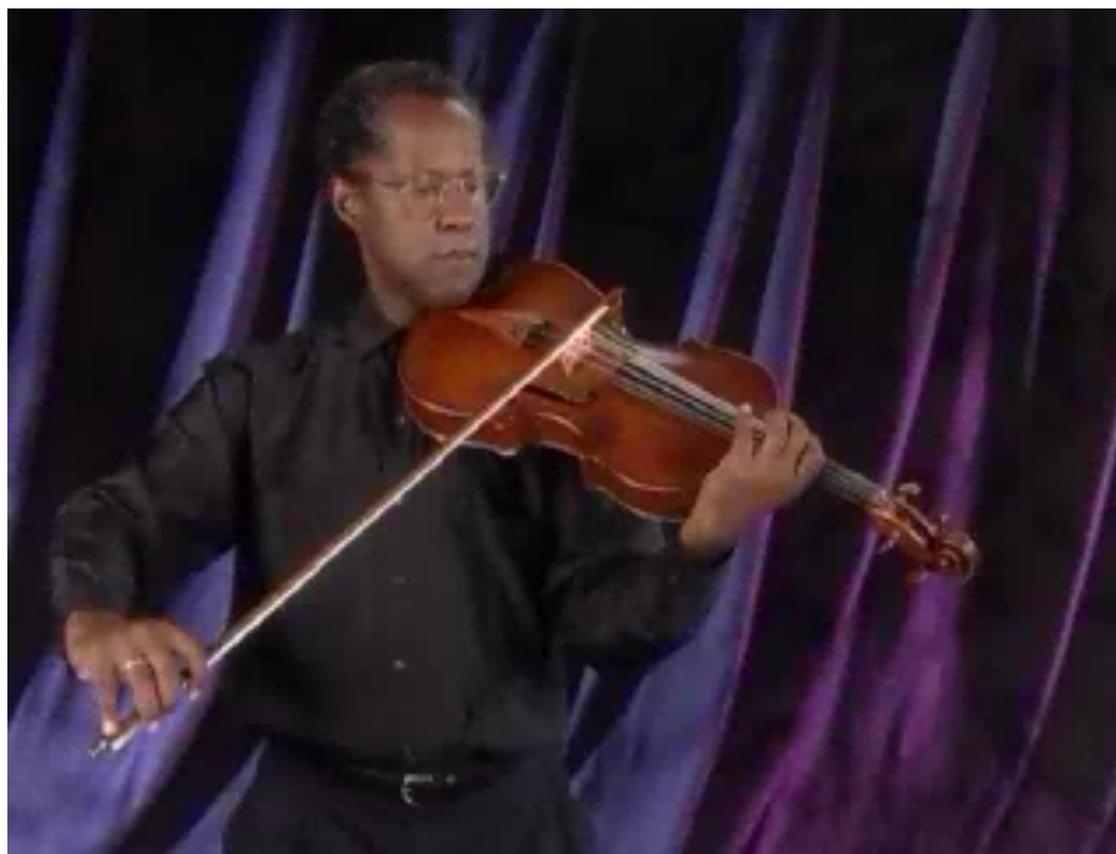
Detailed description: This musical notation is for a violin part in 4/4 time, marked Moderato. It consists of a single staff with a treble clef. The piece begins with a forte (*ff*) dynamic. The first measure contains four eighth notes: G4, A4, B4, and C5, each with a staccato mark. The second measure contains a descending eighth-note pair (B4, A4), followed by a quarter note (G4) and a quarter rest. The third measure contains four eighth notes: G4, F4, E4, and D4, each with a staccato mark. The fourth measure contains a descending eighth-note pair (D4, C4), followed by a quarter note (B3) and a quarter rest. The piece concludes with a piano (*pp*) dynamic.



Staccato com ligadura

Vln. **Lento** **Sounding:**

The image shows two musical staves for a violin. The left staff is labeled 'Lento' and shows a sequence of notes: a quarter note, a quarter note, a quarter note, a quarter note, a half note, and a half note. A slur is placed under the first four notes, and another slur is under the last two notes. A 'V' above the first note indicates the bowing direction. The right staff is labeled 'Sounding:' and shows the same sequence of notes, but with a thick black bar over the notes, indicating the sound envelope. A speaker icon is located to the right of the 'Sounding:' staff.



EXAMPLE 2-34. Stravinsky, *Symphony in Three Movements*, second movement, at 135

$\text{♩} = 76$
(at the point)

Vln. 1

Vla.



MARTELÉ

É uma arcada rápida, bem articulada, pesada e que lembra um *sforzando*. Pode ser tocada na ponta, meio e no talão do arco.



EXAMPLE 2-37. Bruckner, Symphony No. 9, second movement, mm. 52–58

Lively 53

Vln. 1

Vln. 2

Vla.

ff

ff

ff



SPICCATO

EXAMPLE 2-38. Stravinsky, *Dumbarton Oaks Concerto*, first movement, at 22

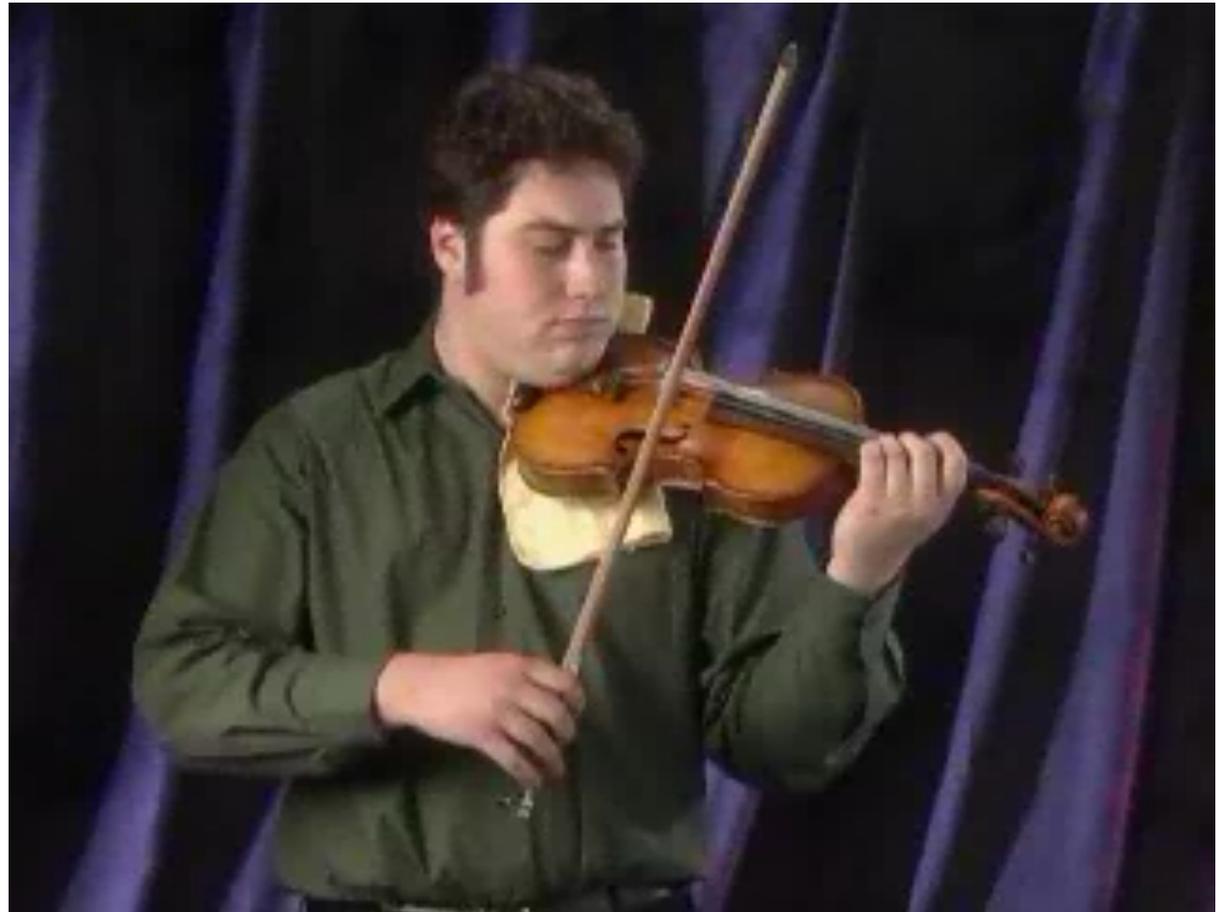
Tempo giusto (♩ = 152)

sim.

Vln. 1



É uma arcada rápida, com notação semelhante ao *staccato*, bem articulada e gerada a partir de pequenos golpes de arco. A performance pode variar de acordo com o caráter do andamento e das dinâmicas.



EXAMPLE 2-39. Rachmaninoff, *Symphonic Dances*, first movement, at 18

Allegro *sim.*

Vln. 1

p

pp



EXAMPLE 2-40. Mahler, Symphony No. 4, first movement, mm. 21-23

The image shows a musical score for two staves: Violin (Vla.) and Viola (Vlc.). The key signature is one sharp (F#) and the time signature is 4/4. The score covers measures 21, 22, and 23. The Violin part starts with a dynamic marking of *pp* and a performance instruction of *legg.* (leggiero). The Viola part also starts with *pp* and *legg.*. The music features a mix of eighth and sixteenth notes, often beamed together, with some measures containing rests. The score is presented in a clean, black-and-white format with a red border.



JETÉ (Fr.); RICOCHET (Eng.)

O Jeté é um rebote controlado de percussões realizadas com o arco sobre a corda.



EXAMPLE 2-41. Rimsky-Korsakov, *Capriccio espagnol*, third movement, mm. 19–22 (violin solo only recorded)

19 **Vivo**

The musical score is written for six instruments: Violin solo, Violin 1, Violin 2, Viola, Violoncello, and Double Bass. The key signature is one flat (B-flat) and the time signature is 2/4. The tempo is marked 'Vivo'. The score shows measures 19 through 22. The Violin solo part has a melodic line with triplets and a trill at the end. The other instruments have rests or simple accompaniment.



EXAMPLE 2-42. Shostakovich, Symphony No. 8, second movement, mm. 67-72

CD-

67 ♩ = 144

Vln. 1

Vln. 2

Vla.

pp

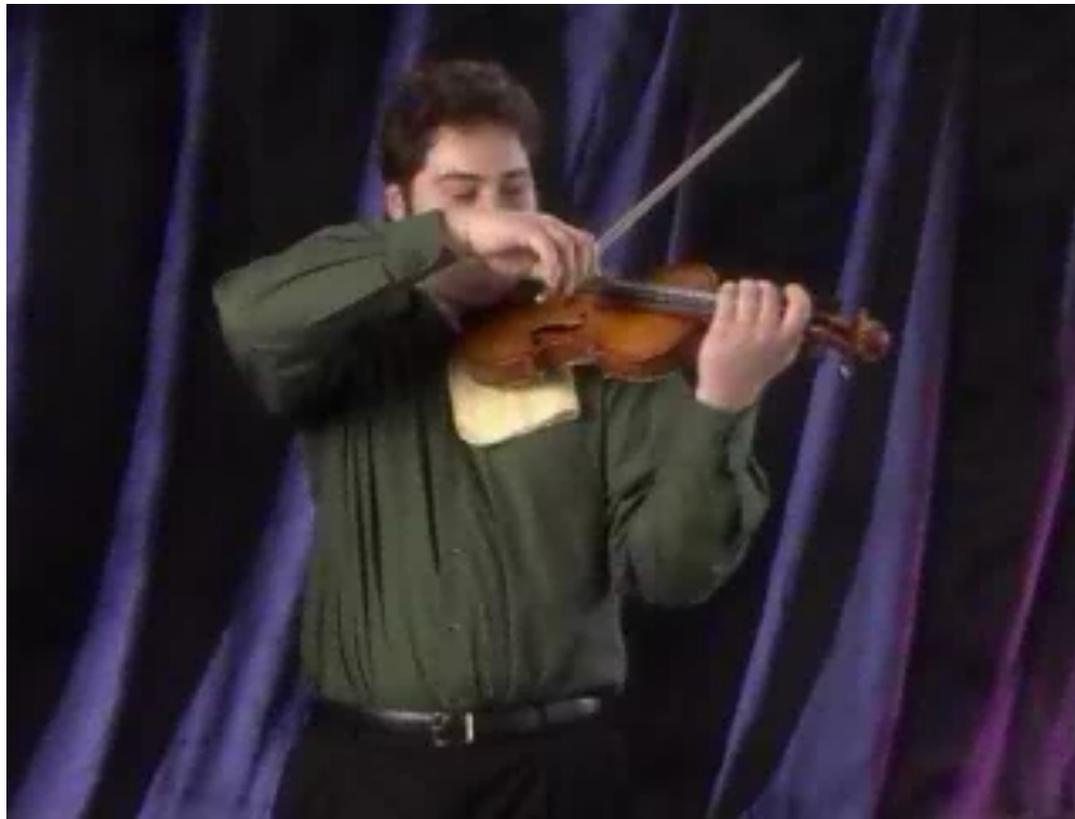
pp

pp



ARPEGGIANDO

Sutilmente diferente do *spiccato*. Funciona como uma arcada na corda.



EXAMPLE 2-43. *Arpeggiando*

Musical score for Example 2-43, *Arpeggiando*. The score is written on a single staff in treble clef, key of D major (one sharp), and 4/4 time. It consists of eight measures. The first two measures feature a descending eighth-note arpeggio with a slur. The next four measures feature a descending eighth-note triplet with a slur and a '3' above each group. The final two measures return to a descending eighth-note arpeggio with a slur.

EXAMPLE 2-44. Mendelssohn, Violin Concerto, first movement, mm. 328–336

Allegro molto

Vln. solo

328

ff

poco a poco dimin.

331

segue

al

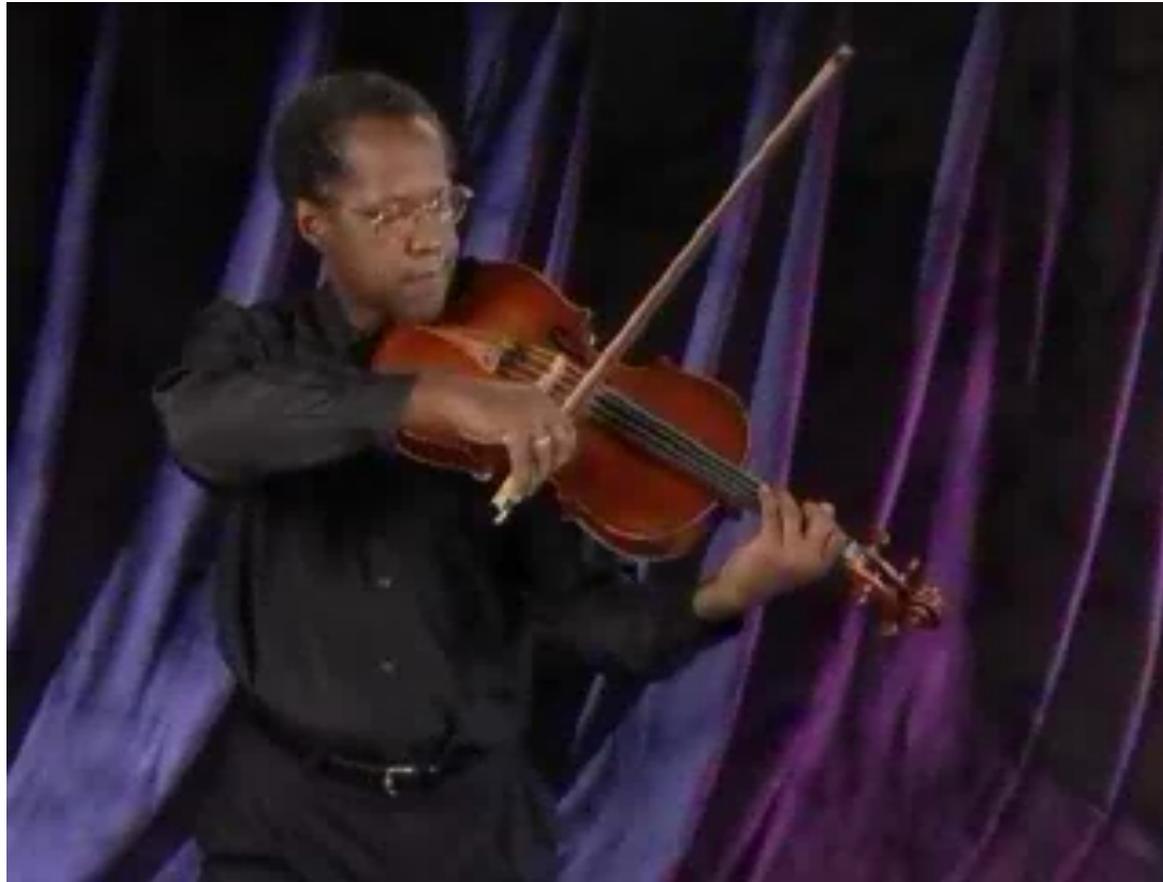
334

pp

Musical score for Example 2-44, Mendelssohn Violin Concerto, first movement, mm. 328–336. The score is written on three staves in treble clef, key of D major (one sharp), and 4/4 time. The first staff (mm. 328–330) begins with a dynamic marking of *ff* and a tempo marking of **Allegro molto**. It features a descending eighth-note arpeggio with a slur and a dynamic marking of *ff*. The second staff (mm. 331–333) continues the arpeggio with a dynamic marking of *poco a poco dimin.* and a *segue* marking. The third staff (mm. 334–336) begins with a dynamic marking of *pp* and a tempo marking of *al*. It features a descending eighth-note arpeggio with a slur.



TRINADOS



TRÊMULOS

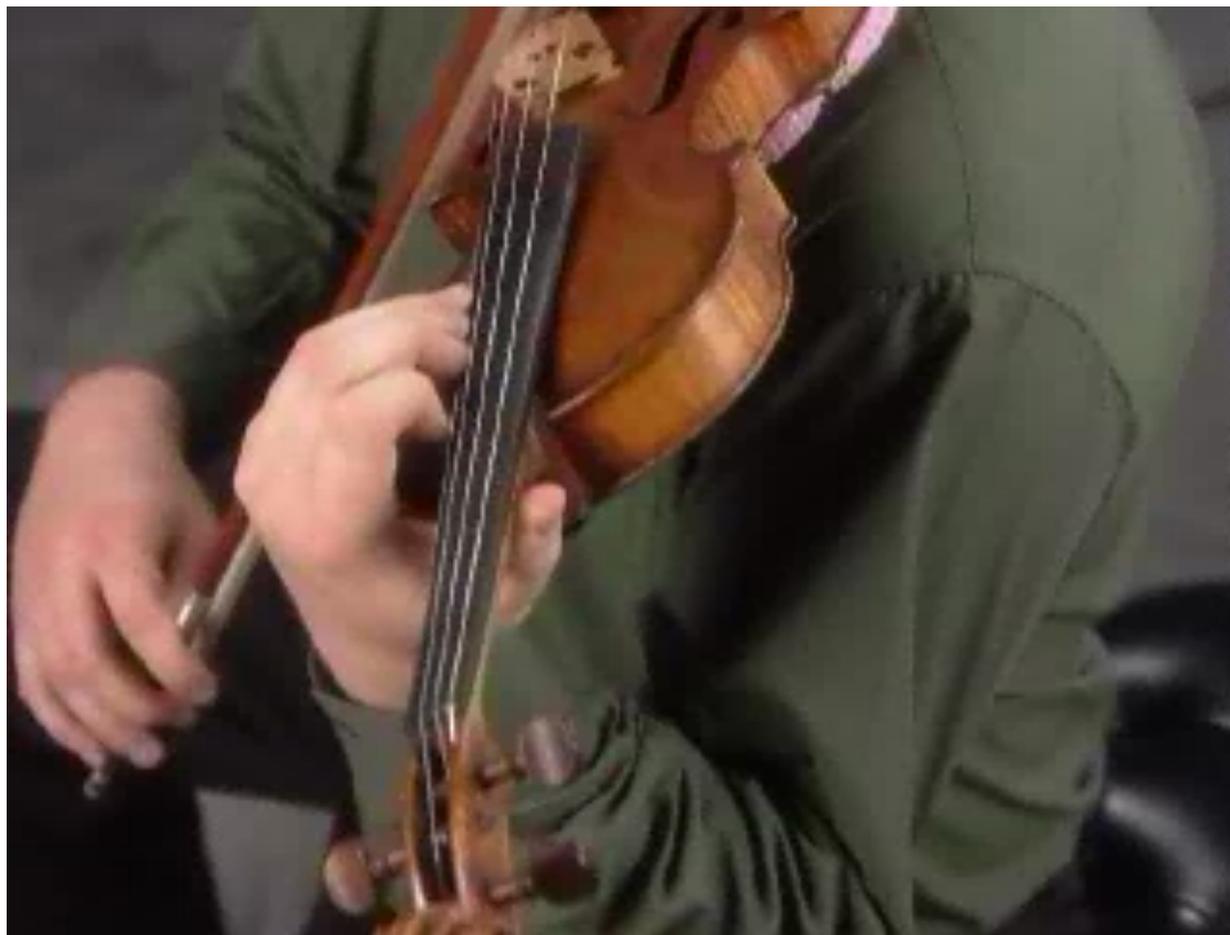
EXAMPLE 2-46. Verdi, Requiem, "Dies irae," mm. 46–51

Allegro agitato (♩ = 80)

Vln. 1

The musical score shows a single staff for Violin 1. It begins with a treble clef, a key signature of one flat (B-flat), and a common time signature (C). The tempo is marked 'Allegro agitato' with a quarter note equal to 80 beats per minute. The dynamics are marked 'ff' (fortissimo). The score consists of measures 46 through 51. Measure 46 starts with a whole note chord of B-flat and D. Measures 47-51 feature a series of chords, each marked with a 'P' (piano) dynamic. The chords are: B-flat and D (measures 47-48), B-flat, D, and F (measures 49-50), and B-flat, D, and F (measure 51). The notes are written as stems with flags, indicating a tremolo effect.

Extensivamente utilizado em todos os instrumentos. Existem dois tipos de trêmulos: trêmulo de arco e trêmulo de dedo.



EXAMPLE 2-47. Debussy, *La Mer*, first movement, at 8

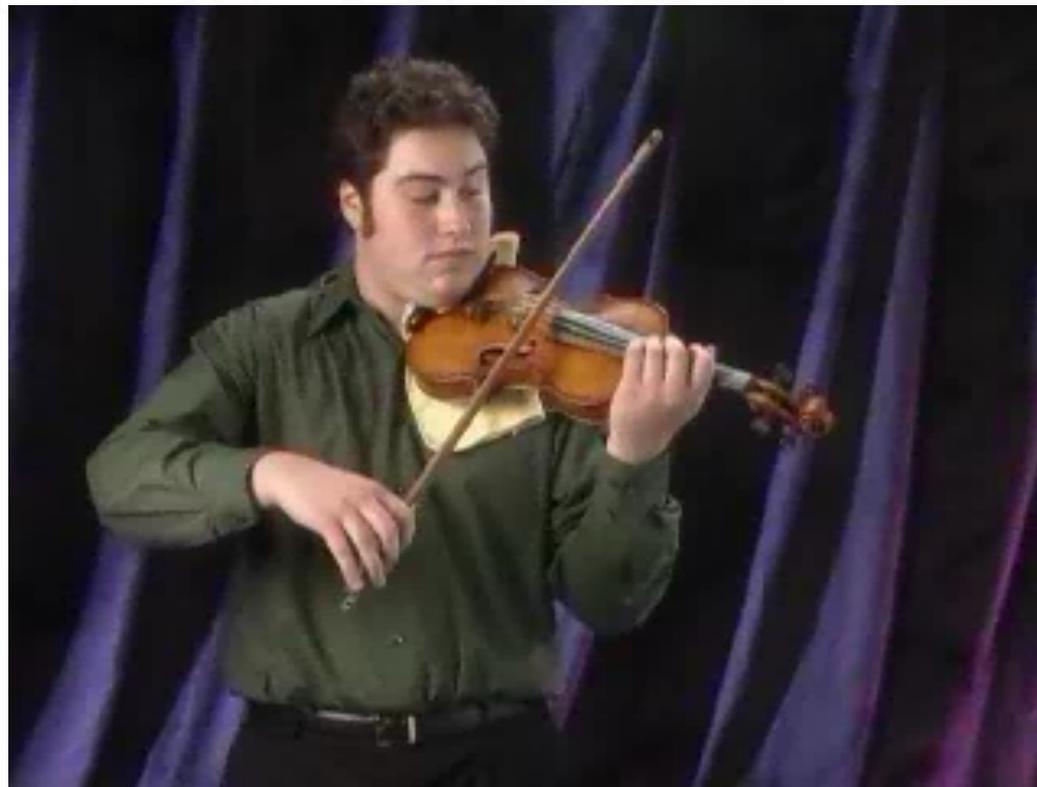
Modéré

Vln. 1

Vln. 2

p *mf* *p* *mf*

p *mf* *p* *mf*



Diferentes utilizações com o arco

SUL TASTO (Francês: *Sur la touche*)

EXAMPLE 2-51. Debussy, *Ibéria*, part 2, at 40

$\text{♩} = 92$
sur la touche (espressif et doucement soutenu)

Vle. 

O músico toca com o arco em cima do espelho obtendo um som “flautado”, suave e com menos harmônicos agudos. Técnica também adaptada e utilizada em outros instrumentos de corda, como o violão.

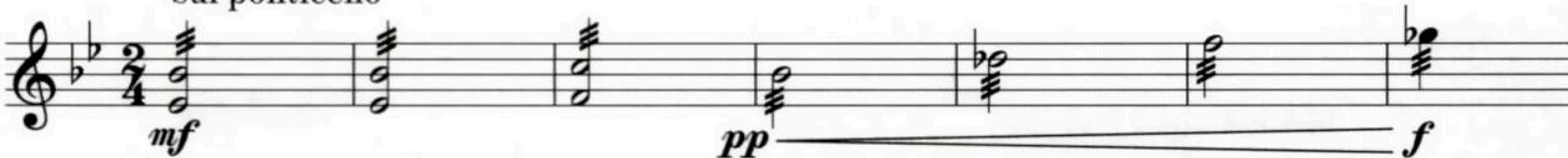


SUL PONTICELLO (Francês: *Al chevalet*)

EXAMPLE 2-52. Puccini, *Madama Butterfly*, Act I, 3 mm. before 38

Allegro (♩ = 144)
sul ponticello

Vln. 1



The musical score for Violin 1 (Vln. 1) is written in treble clef with a key signature of one flat (B-flat) and a 2/4 time signature. The tempo is marked 'Allegro' with a quarter note equal to 144 beats per minute. The instruction 'sul ponticello' is written above the staff. The score consists of seven measures of chords. The first measure starts with a dynamic marking of *mf*. The second measure is a whole chord. The third measure is a whole chord. The fourth measure is a whole chord with a dynamic marking of *pp* below it. The fifth measure is a whole chord. The sixth measure is a whole chord. The seventh measure is a whole chord with a dynamic marking of *f* below it. A horizontal line with a wedge-shaped crescendo/decrescendo hairpin connects the *pp* and *f* markings, indicating a dynamic shift over the last three measures.

A indicação de *sul ponticello* determina que o músico deve passar o arco próximo ao cavalete, o que origina um som de timbre agudo, de arranhadura, com menos fundamental e muitos harmônicos agudos.



COL LEGNO

EXAMPLE 2-53. R. Strauss, *Also sprach Zarathustra*, at 12

Sehr langsam
col legno

Vln. *pp*



O arco é segurado de lado e as cordas são friccionadas ou percutidas com a madeira e não com as cerdas.



COL LEGNO BATTUTO



EXAMPLE 2-54. Berlioz, *Symphonie fantastique*, fifth movement, mm. 444–455

Allegro
frappez avec les bois de l'archet

444

Vln. 1

Vln. 2

Vla.

(col legno battuta)

Vlc. 1

Vlc. 2

D.B.

mf

pp

pizz.

pp

tr



450

Vln. 1

Vln. 2

Vla.

Vcl. 1

Vcl. 2

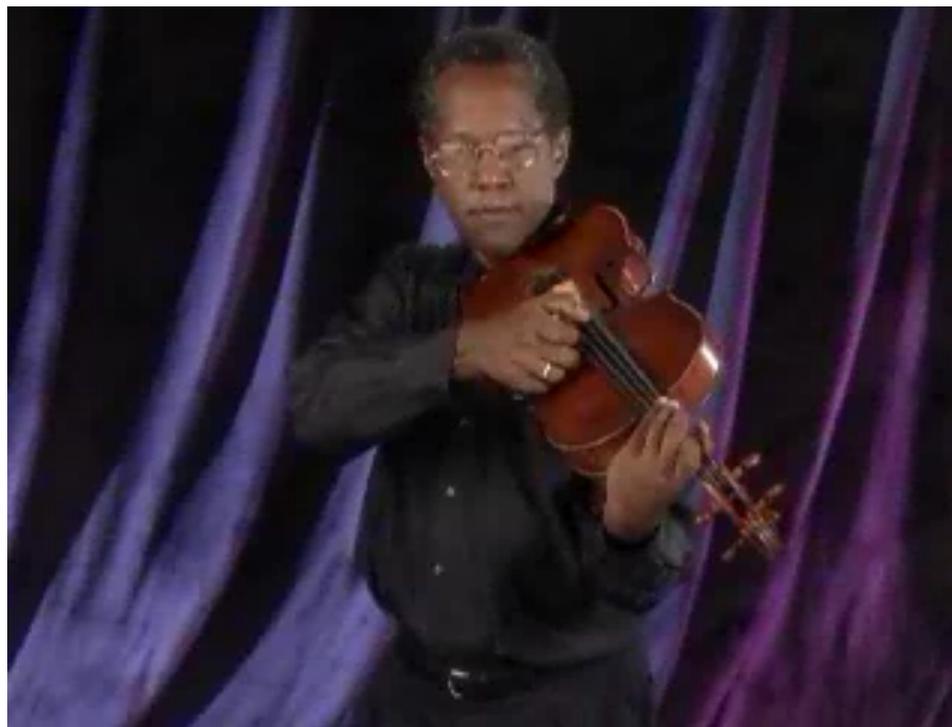
D.B.

Detailed description: This is a musical score for a string ensemble, covering measures 450 to 455. The score is arranged in six staves. The first two staves are for Violins 1 and 2, both in treble clef. The third staff is for Viola in alto clef. The fourth and fifth staves are for Violas 1 and 2, both in bass clef. The sixth staff is for Double Bass in bass clef. The music consists of six measures. Measures 450-452 feature rapid sixteenth-note passages in the upper strings. Measures 453-455 feature a more rhythmic pattern with eighth and sixteenth notes, including trills in the first Violin and Viola parts.

Efeitos timbrísticos sem o arco

PIZZICATO

Efeito muito comum em todo o repertório para cordas, acontece com a mudança na maneira como o som é produzido. No *pizzicato* as notas são beliscadas (pinçadas) ao invés de se utilizar o arco. É indicado na partitura com a abreviatura *pizz.*. Quando deseja-se voltar ao arco escreve-se acima do início da passagem o termo *arco*.



EXAMPLE 2-55. Brahms, Symphony No. 1, fourth movement, mm. 1-17

Adagio

The musical score consists of five staves, each representing a different instrument. The key signature is two flats (B-flat and E-flat), and the time signature is common time (C). The tempo is marked 'Adagio'. The score is divided into measures 1 through 17. Dynamics include *p* (piano), *fp* (fortissimo piano), *dim.* (diminuendo), and *pizz.* (pizzicato). The Viola part includes a 'div.' (divisi) marking. The Violin 1 and 2 parts have a *pizz.* marking in the final measure. The Violoncello and Double Bass parts have a *pizz.* marking in the final measure.



7 string. poco a poco

The musical score consists of five staves for string instruments. The first two staves are for Violins 1 and 2, the third for Viola, and the last two for Violoncello and Double Bass. The score begins at measure 7. The key signature has two flats (B-flat and E-flat), and the time signature is 3/4. The tempo/mood is indicated as 'string. poco a poco'. The dynamic marking 'f' (forte) is present in the second measure of each staff. A 'cresc.' (crescendo) marking is placed above the staves in the fourth measure of each part. The notation includes various rhythmic values such as eighth and sixteenth notes, and rests.

12

Violin 1 (Vln. 1): *ff*, arco, *p*, *fp*, *dim.*, pizz., *p*

Violin 2 (Vln. 2): *ff*, arco, *p*, *fp*, *dim.*, pizz., *p*

Viola (Vla.): *ff*, arco, *p*, *fp*, *dim.*, pizz., *p*

Violoncello (Vlc.): *ff*, arco, *p*, *fp*, *dim.*, pizz., *p*

Double Bass (D.B.): *ff*, arco, *p*, *fp*, *dim.*, pizz., *p*

EXAMPLE 2-58. Bartók, String Quartet No. 4, fourth movement, mm. 56–63

Allegretto

56

Vln. 1

Vln. 2

Vla.

Vlc.

sf

sf

ben marcato



60

Vln. 1

Vln. 2

Vla.

Vlc.

cresc.

cresc.

cresc.

cresc.

I

IV

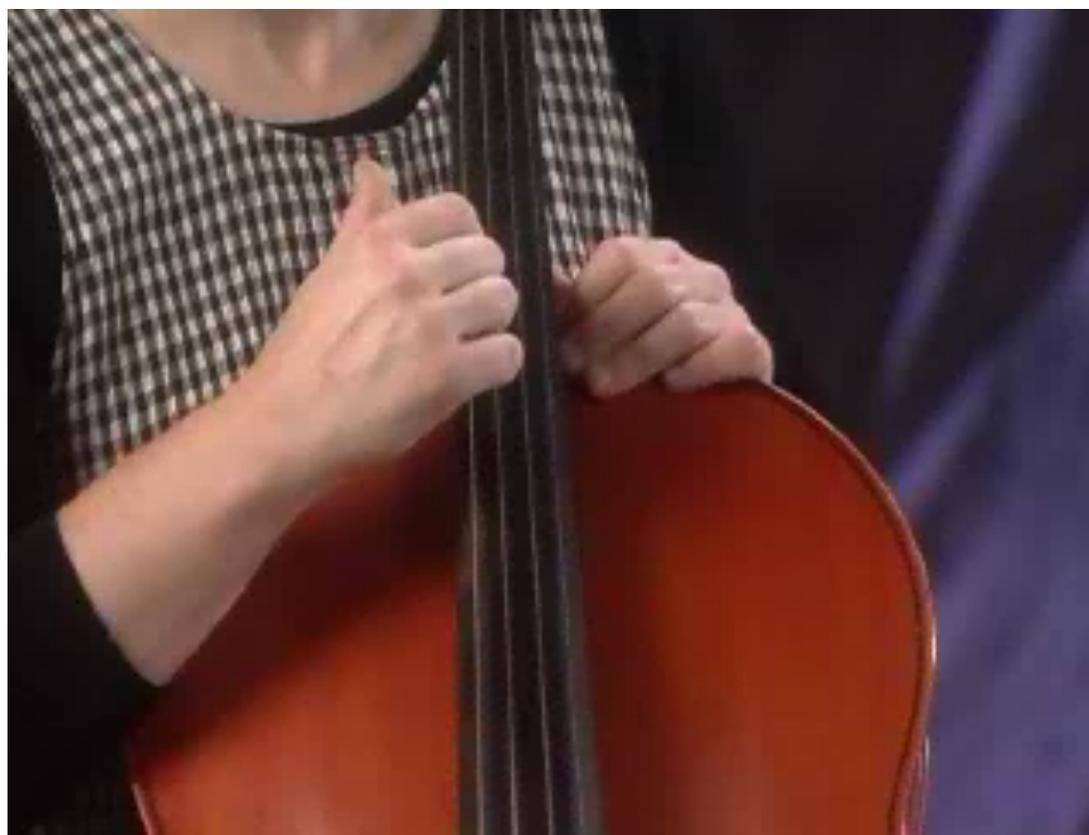
f

f

f

f

Pode-se indicar a direção do pizzicato ou até mesmo escrever:
quasi chitarra ou *a la chitarra*.



EXAMPLE 2-60. Bartók, *Concerto for Orchestra*, fifth movement, mm. 5–9

accel al Presto (♩ = c. 134–146)

5

Vln. 2

put the bow aside

pizz.

f *dim.*

sempre sim.

pp

punta d'arco

Vla.

put the bow aside

pizz.

f *dim.*

sempre sim.

pp

Vlc.

put the bow aside

pizz.

f *dim.*

pp

pizz.

D.B.

f

pp



CON SORDINO (It.); AVEC SOURDINE (Fr.);

Pequena peça de madeira ou metal que se prende ao cavalete de modo a atenuar as suas vibrações modificando o timbre do instrumento. Para adicionar a surdina escreve-se *con sordino* e para retirar-la escreve-se *senza sordino* acima do início da passagem. Deve-se ter atenção ao tempo necessário para o músico adicionar ou retirar a surdina antes de atacar com o arco.



EXAMPLE 2-63. Weber, *Oberon*, Overture, mm. 13–21

Adagio
con sordino

13

Vln. 1

Vln. 2

Vla.

Vlc.

pizz.

arco



16

Vln. 1

Vln. 2

Vla.

Vlc. 1

Vlc. 2

senza sordino

senza sordino

1.

2.

D.B. tacet

The image shows a musical score for five instruments: Violin 1, Violin 2, Viola, Violoncello 1, and Violoncello 2. The score is in G major (one sharp) and 4/4 time. It begins at measure 16. The Violin parts (Vln. 1 and Vln. 2) are marked 'senza sordino'. The Viola part has two first endings (1. and 2.) in the first two measures. The Violoncello parts (Vlc. 1 and Vlc. 2) are marked 'D.B. tacet' (Double Bass tacet). The score consists of five measures. The first two measures feature first endings for the Viola. The third measure has a double bar line. The fourth and fifth measures continue the musical material. The key signature has one sharp (F#) and the time signature is 4/4.

Sons produzidos com o apoio leve do dedo sobre a corda em pontos específicos gerando alturas correspondentes às da série harmônica com timbre diferenciado. Existem os harmônicos naturais e os harmônicos artificiais.



Harmônicos naturais



Fundamental



Fund.



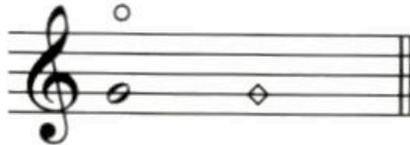
Fund.



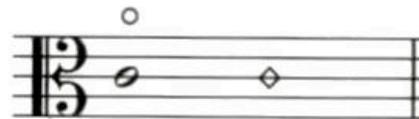
Fund.

SEGUNDO PARCIAL

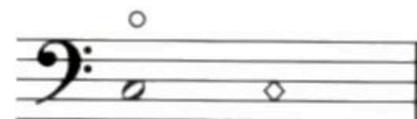
Violin
Sul G or IV



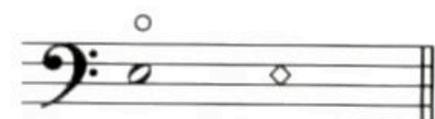
Viola
Sul C or IV



Cello
Sul C or IV

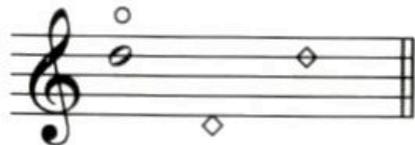


Double Bass
Sul E or IV



TERCEIRO PARCIAL

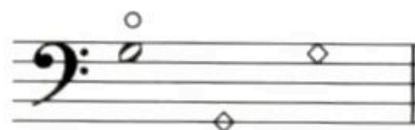
Violin
Sul G



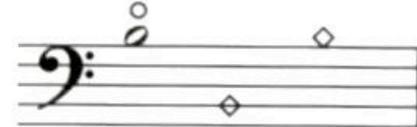
Viola
Sul C



Cello
Sul C

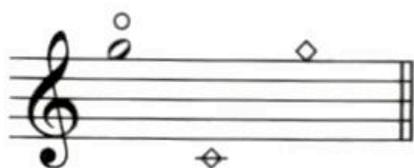


Double Bass
Sul E

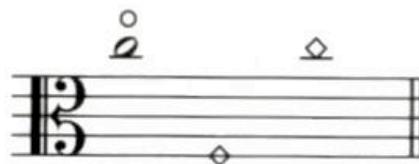


QUARTO PARCIAL

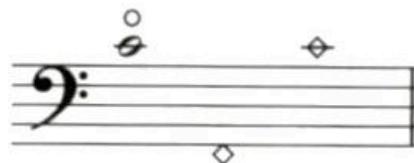
Violin
Sul G



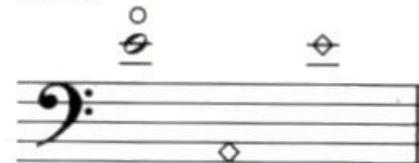
Viola
Sul C



Cello
Sul C

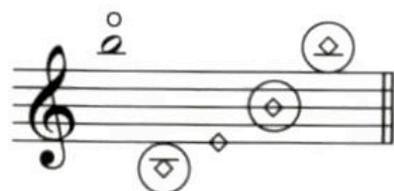


Double Bass
Sul E

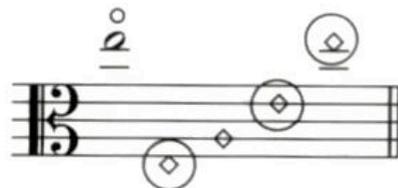


QUINTO PARCIAL

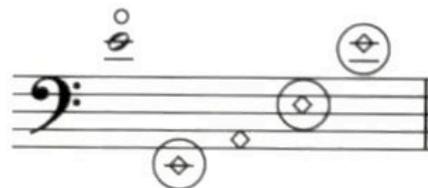
Violin
Sul G



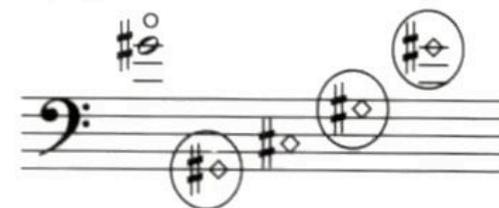
Viola
Sul C



Cello
Sul C



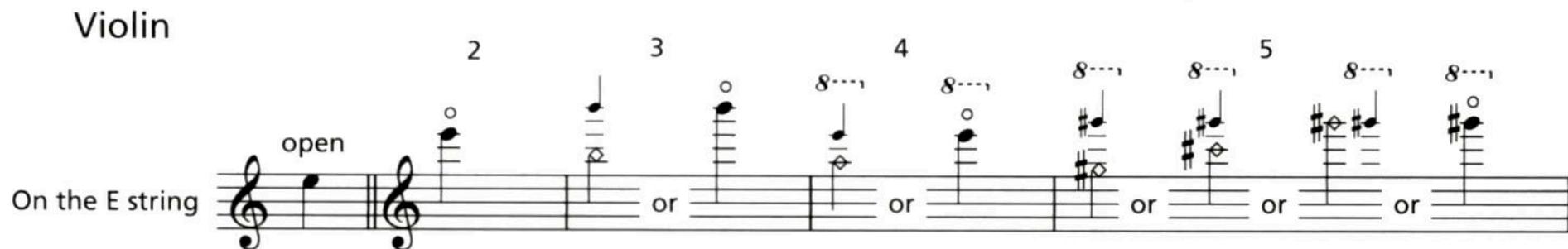
Double Bass
Sul E



Notação de harmônicos naturais

Existe duas maneiras de notar os harmônicos:

- 1) Escreve a nota na altura que o harmônico deve soar e adiciona-se um pequeno círculo acima da cabeça da nota;
- 2) Escreva nota em forma de losango no local do nodo onde vai originar o som harmônico (não indica precisamente a nota que vai soar).

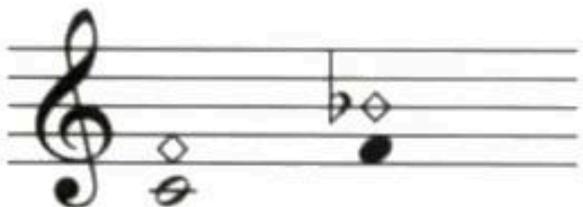


Confira o guia para harmônicos naturais para cada instrumento disponibilizado no blog.

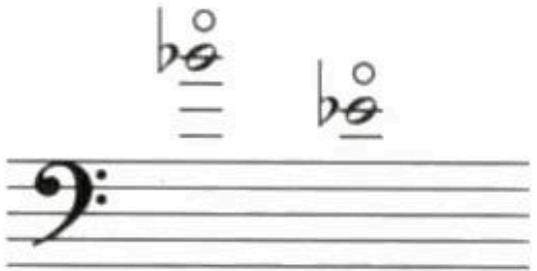
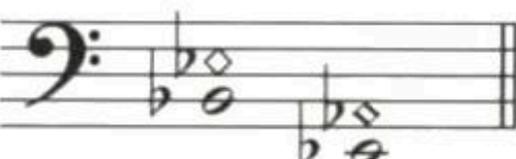
Harmônicos artificiais

O músico utiliza dois dedos da mão esquerda para produzir os harmônicos em intervalos de terça, quarta e até quinta. São tranquilos de serem produzidos no violino e na viola. Os violoncelistas, em geral, utilizam o polegar para alcançar, no máximo uma quarta. Não é recomendado a utilização de harmônicos artificiais para o contrabaixo.

Notação de harmônicos artificiais

Vln.  sounds 

Vla.  (•) (#s)

Vlc.  should be notated 

Última região onde são funcionais os harmônicos artificiais

The image displays three musical examples of artificial harmonics for different instruments:

- Vln. (Violin):** Shows a note on the G string (G4) with a natural harmonic symbol (a triangle) above it. To the right, the word "sounds" is followed by a staff showing the resulting natural harmonic on the G string, labeled 15^{ma}_1 .
- Vla. (Viola):** Shows a note on the C string (C3) with a natural harmonic symbol above it. To the right, "sounds" is followed by a staff showing the resulting natural harmonic on the C string, labeled 8^{va}_1 .
- Vcl. (Violoncello):** Shows a note on the C string (C2) with a natural harmonic symbol above it. To the right, "sounds" is followed by a staff showing the resulting natural harmonic on the C string, labeled 8^{va}_1 .

Cordas - Harmônicos Artificiais

The diagram illustrates the relationship between the fingering/bowing technique and the resulting sound for five types of artificial harmonics on a string. The top staff, labeled "Soa" (Sound), shows the notes produced. The bottom staff, labeled "Escreve" (Write), shows the corresponding fingering and bowing techniques.

Escreve (Technique)	Soa (Sound)
8ª	Open string note
5ª	Harmonic note (1/2 octave above)
4ª	Harmonic note (2/3 octave above)
3ª	Harmonic note (3/4 octave above)
3ª _m	Artificial harmonic note (3/4 octave above, flat)

EXAMPLE 2-78. Debussy, *Ibéria*, part 1, at 15

$\text{♩} = 160$

Vln. 1

p



EXAMPLE 2-77. Saint-Saëns, Violin Concerto, second movement, end (last 13 mm. only heard on recording)

Andante

Vln. solo

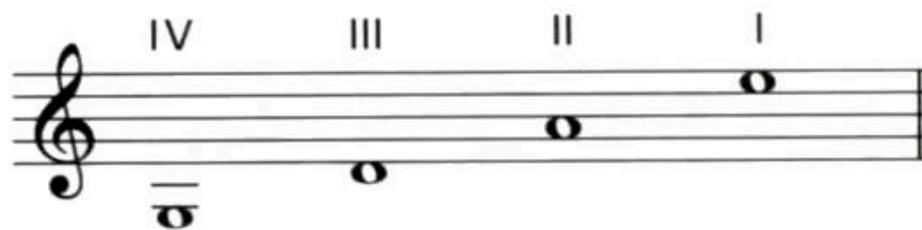
Solo



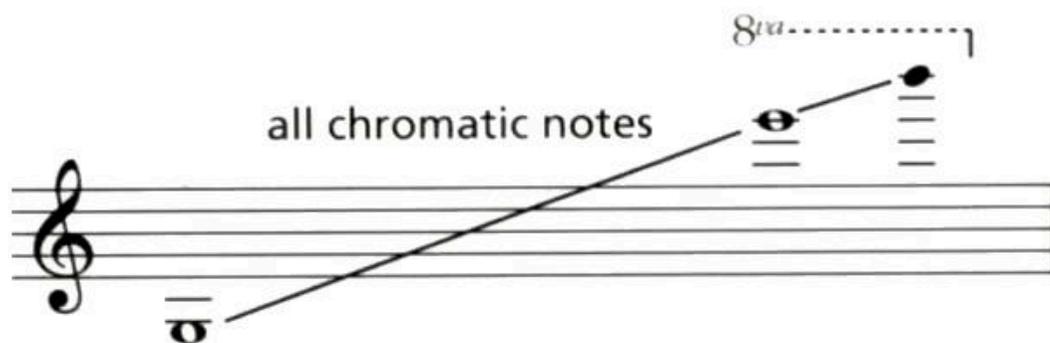
Aspectos individuais

Violino

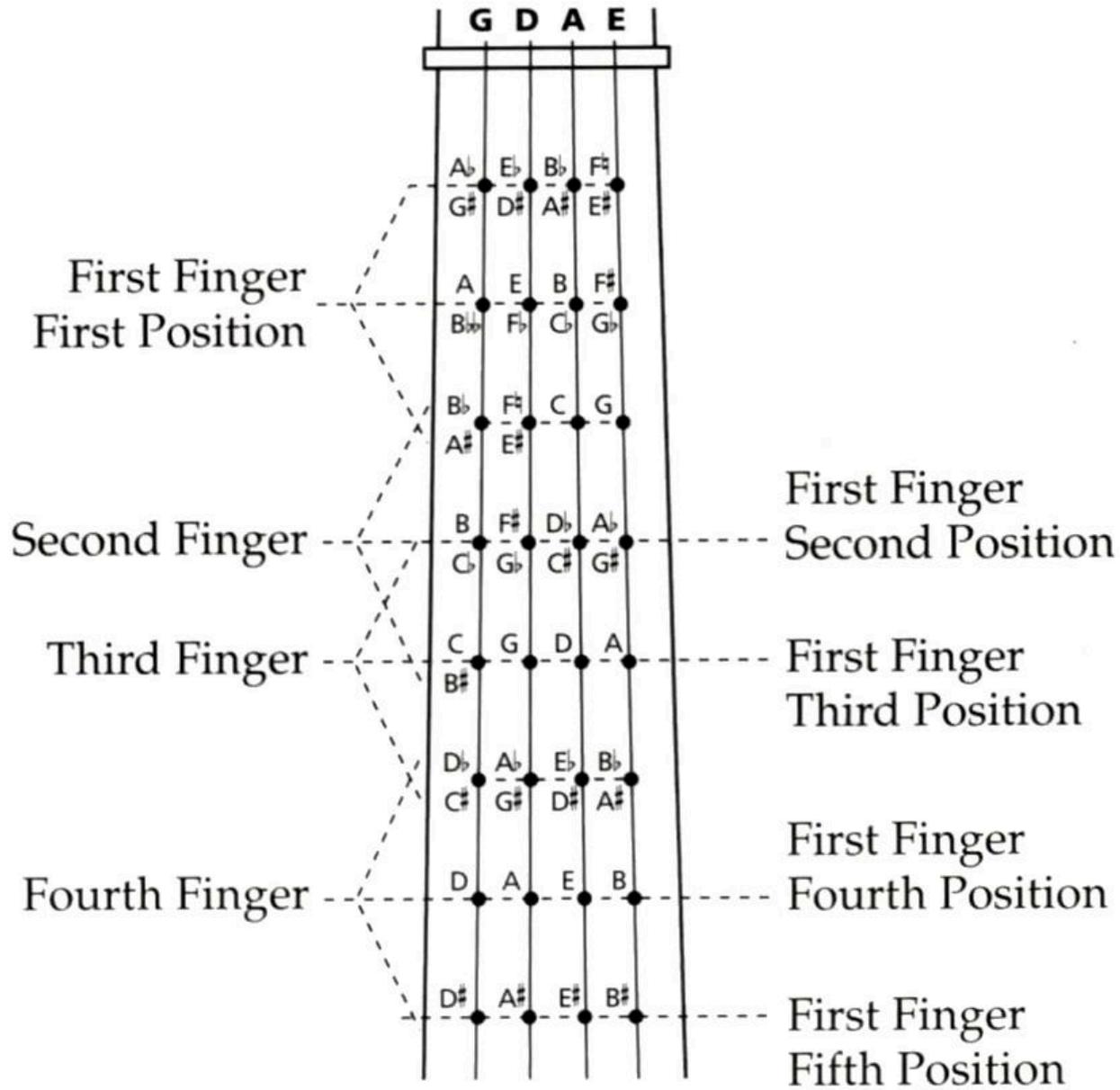
AFINAÇÃO



TESSITURA



DEDILHADO



PASSAGENS TOCADAS EM UMA ÚNICA CORDA

EXAMPLE 3-5. Tchaikovsky, Symphony No. 5, second movement, mm. 111–119

111 **Andante** Sul G

Vln. 1

mf sf mf

116

f mf



PASSAGENS TOCADAS EM UMA ÚNICA CORDA

EXAMPLE 3-6. Rimsky-Korsakov, *Sheherazade*, third movement, mm. 1–8

The image shows a musical score for a violin part. It consists of two staves of music in G major (one sharp) and 6/8 time. The first staff is marked 'Vln.' and 'Sul D' (Sul ponticello), with a dynamic marking of 'p' (piano) and a fingering '1'. The second staff is marked with a '4' above the first measure, indicating a fourth finger position. The music features a mix of eighth and sixteenth notes, often beamed together, with some notes tied across bar lines.



PASSAGENS TOCADAS EM UMA ÚNICA CORDA

EXAMPLE 3-7. Puccini, *Madama Butterfly*, Act II, at 16

Largamente
Sul A

Vln. 1

f



PASSAGENS TOCADAS EM UMA ÚNICA CORDA

EXAMPLE 3-8. R. Strauss, *Don Juan*, mm. 9–17

Vln. 1

9

Allegro
Sul E

ff

14



EXAMPLE 3-9. Prokofiev, *Classical Symphony*, second movement, mm. 5–13

Vln. 1

5

Sul E

pp

9



HARMÔNICOS

QUARTA

Actual harmonics

Lightly touched note
Fingered note

8va - - - - -

3 4 4 4 3 4 4 4 3 4 4 4 3 4 4

0 1 1 1 0 1 1 1 0 1 1 1 0 1 1

QUINTA

Actual harmonics

Lightly touched note
Fingered note

0 1 1 1 1 1 1 1

TERÇA MAIOR

Actual harmonics

Lightly touched note
Fingered note

The image shows two musical staves for a major third. The top staff, labeled 'Actual harmonics', shows three natural harmonics on a treble clef staff: the 2nd harmonic (G4), the 3rd harmonic (B4), and the 4th harmonic (D5). The bottom staff shows the corresponding fingered notes: G4 (lightly touched), B4 (fingered), and D5 (fingered).

TERÇA MENOR

Actual harmonics

Lightly touched note
Fingered note

The image shows two musical staves for a minor third. The top staff, labeled 'Actual harmonics', shows five natural harmonics on a treble clef staff: the 2nd harmonic (F#4), the 3rd harmonic (A4), the 4th harmonic (C5), the 5th harmonic (D5), and the 6th harmonic (F5). The bottom staff shows the corresponding fingered notes: F#4 (lightly touched), A4 (fingered), C5 (fingered), D5 (fingered), and F5 (fingered). Fingerings are indicated by numbers 3, 2, 3, 3, 3 above the notes, and a 0 below the A4 note.

EXAMPLE 3-18. Copland, Symphony No. 3, fourth movement, 3–8 mm. after

128

Allegro

Vln. 1

Vln. 2



EXAMPLE 3-19. Webern, Six Pieces for Orchestra, Op. 6, No. 5, mm. 20–26 (strings only)

rit. . . . noch langsamer (♩ = ca. 60)

8va.

20 mit Dmpf. *pp* *verlöschend*

Vln. Solo

Vln. 1

Vln. 2

Vla.

Vlc. 1

Vlc. 2

EXAMPLE 3-20. Stravinsky, *Le Sacre du printemps*, at 101 (strings only)

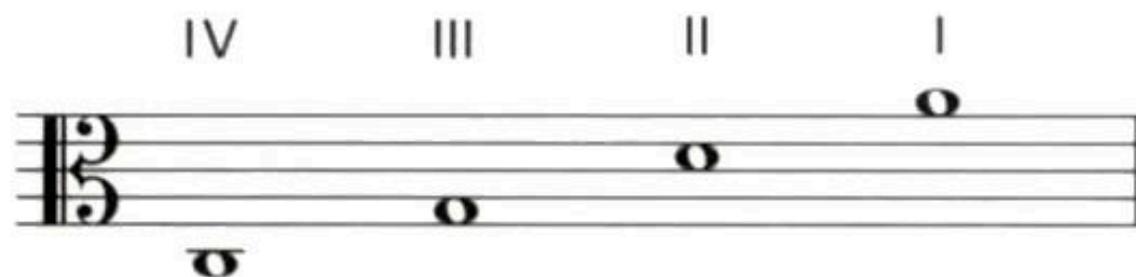
The image shows a musical score for strings from Stravinsky's *Le Sacre du printemps*, measures 101-104. The score is written for a string ensemble and includes the following parts:

- Vln. 1 div.:** Violin 1, divided into six parts (1-6). Measures 1-6 are marked with *div.*
- Vln. 2 div.:** Violin 2, divided into four parts (1-4). Measures 1-4 are marked with *div.*
- Vla. div.:** Viola, divided into three parts (1-3). Measures 1-3 are marked with *div.*
- Vlc. 3 soli:** Violoncello, three solo parts (1-3). Measures 1-3 are marked with *arco*.
- gli altri Vlc. unis.:** Other cellos, unison. Measures 1-3 are marked with *unis.*

The score is in 4/4 time and features complex rhythmic patterns and dynamic markings. The key signature is one sharp (F#).

Viola

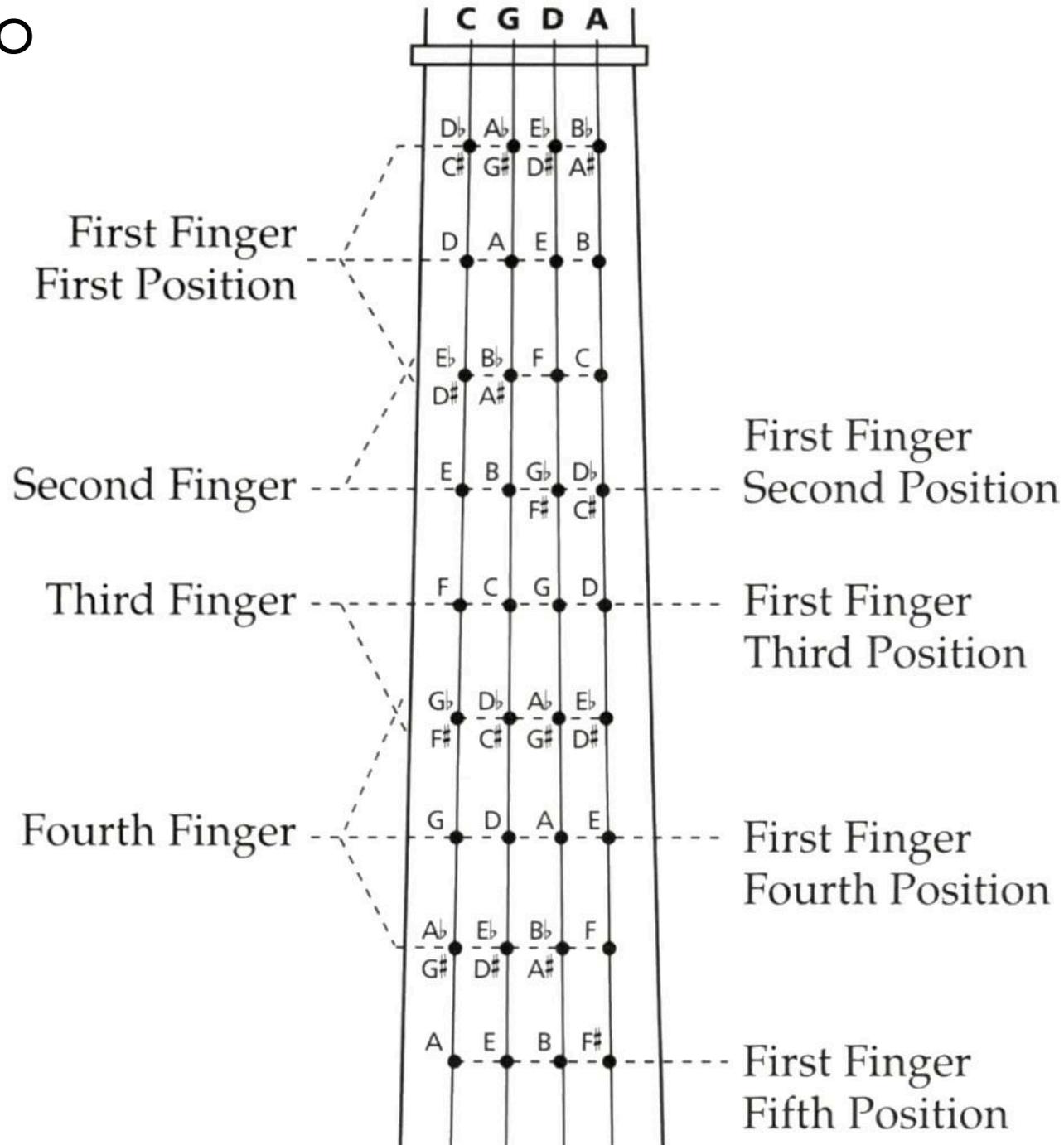
AFINAÇÃO



TESSITURA



DEDILHADO



PASSAGENS TOCADAS EM UMA ÚNICA CORDA

EXAMPLE 3-31. Hindemith, Sonata, Op. 11, No. 4, first movement, mm. 15–16



15 *Sehr breit* *Cadenza*

Vla.

f *f* *pp*

EXAMPLE 3-32. Bartók, Concerto for Orchestra, fourth movement, mm. 42–51



42 *Andante*

Vla.

f cantabile

EXAMPLE 3-33. Hindemith, *Der Schwanendreher*, first movement, mm. 48–59

Bewegt

48

Vla.

mf *f*

51

55



Corda A

EXAMPLE 3-37. Mendelssohn, *A Midsummer Night's Dream*, Overture,
mm. 45–49

Fast

45

Vln. 1 div.

Vln. 2 div. pizz. arco

Vla. pizz.

48

Vln. 1

Vln. 2 unis.

Vla.

EXAMPLE 3-38. Wagner, *Lohengrin*, Act III, "In fernen Land," mm. 12-19



Fast

12 *div.* *sempre f*

Vln. 1

Vln. 2

Vla. *f*

16

Vln. 1

Vln. 2

Vla.

EXAMPLE 3-39. Berlioz, *Symphonie fantastique*, first movement, mm. 155–159

Allegro

155

Vln. I

Vla.

ff *sf* *sf*

ff *sf* *sf*



EXAMPLE 3-40. Beethoven, *Symphony No. 5*, second movement, mm. 1–10

Andante

1

Vla.

Vlc.

p dolce

p dolce

6

Vla.

Vlc.

f *p* *f* *p*

f *p* *f* *p*

p dolce *p dolce*

f *p* *f* *p*

f *p* *f* *p*



EXAMPLE 3-41. Scriabin, *Poem of Ecstasy*, mm. 22–25

22 **Slowly**

Vla.
solo

p espr. *poco cresc.* *dim.*



EXAMPLE 3-42. R. Strauss, *Don Quixote*, Variation 2, Vivace, mm. 1-19



1 **Rather free**

Vla. solo

mf 3

3 *pp*

7 **lebhaft** *espr.* *f* *p* 3 3

11 *mf*

15 *p* 3 3 *pp*

EXAMPLE 3-43. Stravinsky, *Le Sacre du printemps*, "Cercles mystérieux des adolescentes," at 91

Andante con moto (♩ = 60)

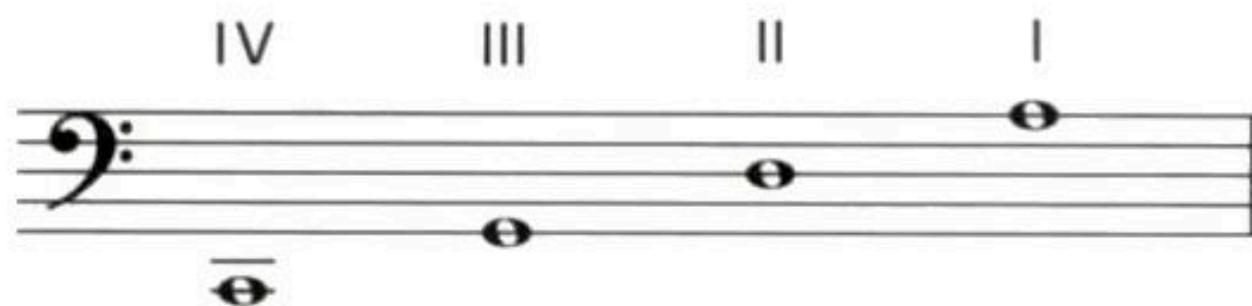
6 Vla. soli

The musical score consists of six staves, each representing a solo violin. The music is written in a key signature of three sharps (F#, C#, G#) and a common time signature. The tempo is marked 'Andante con moto' with a quarter note equal to 60 beats per minute. The dynamics are marked 'molto cant. ma non f'. The score is divided into four measures, each with a different time signature: 4/4, 2/4, 4/4, and 3/4. The first and third measures are in 4/4 time, the second in 2/4, and the fourth in 3/4. The music features a melodic line with a dotted quarter note followed by an eighth note, and a bass line with a dotted quarter note followed by an eighth note. The first and third measures have a fermata over the final note. The second measure has a sharp sign above the final note. The fourth measure has a sharp sign above the final note.

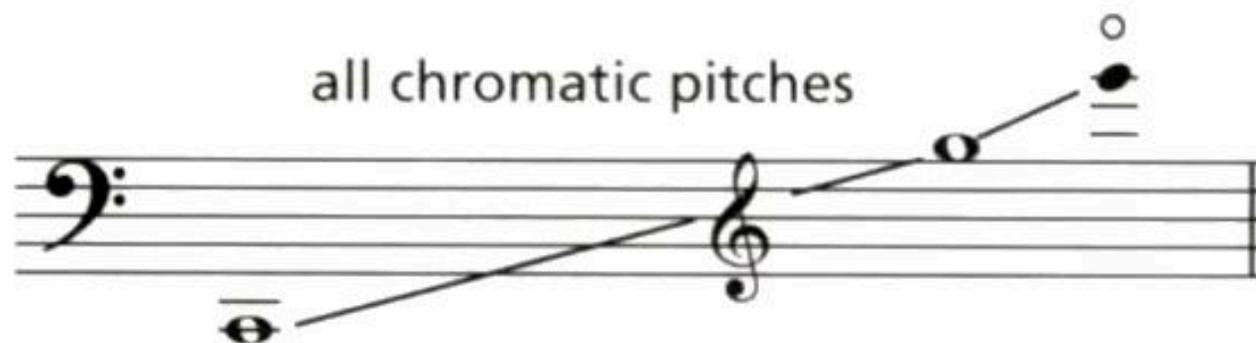


Violoncelo

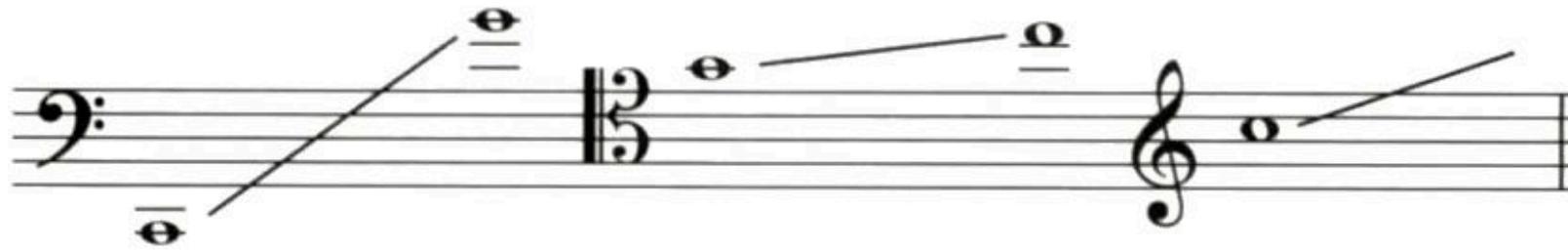
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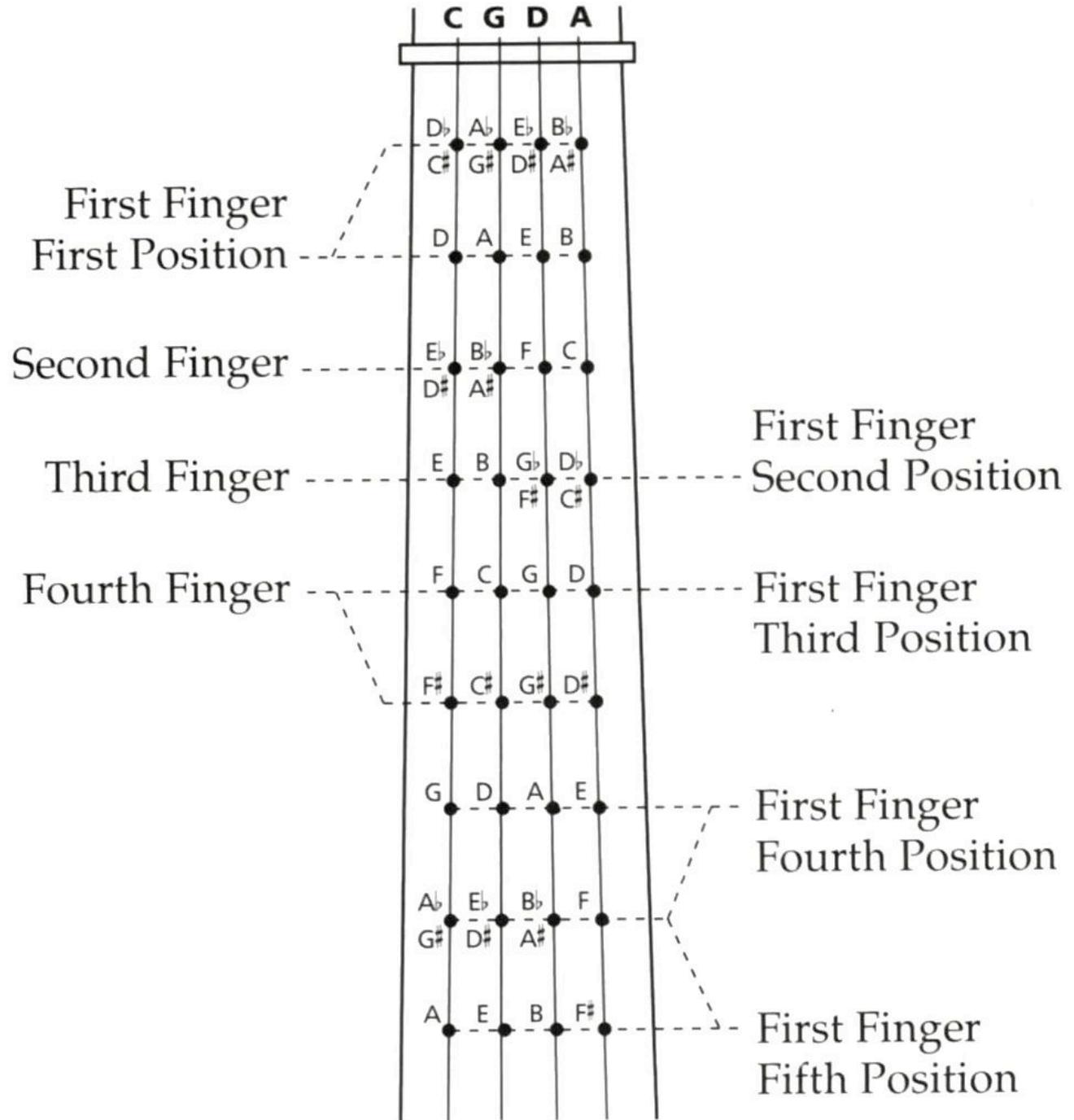
TESSITURA



CLAVES



DEDILHADO



HARMÔNICOS

a. NATURAL HARMONICS

Actual harmonics

Third string

Lightly touched note

Actual harmonics

Fourth string

Lightly touched note

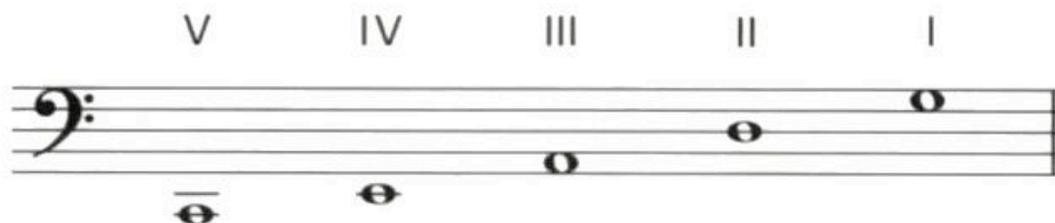
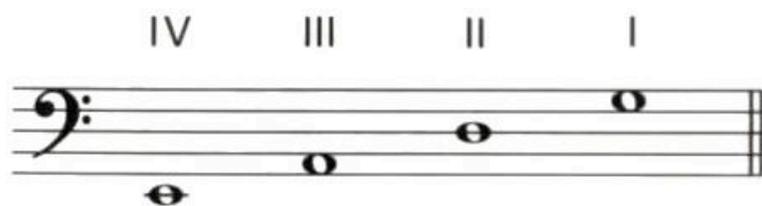
b. NATURAL AND ARTIFICIAL HARMONICS

Actual harmonics

1 0 2 0 4 0 4 1 0 3 3 3 3 3 3 3 3

Contrabaixo

AFINAÇÃO



NOTAÇÃO

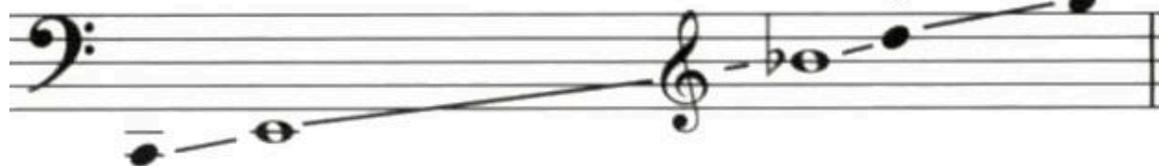


sounds



TESSITURA

all chromatic pitches



EXAMPLE 3-69. Beethoven, Symphony No. 4, fourth movement, mm. 319–323

Allegro

319

Vln. 1

Vln. 2

Vla.

Vlc.
D.B.

pp

pp

pp

EXAMPLE 3-70. Beethoven, Symphony No. 4, fourth movement, mm. 319–323, clarified

Vlc.

D.B.

pp

pp

etc.

Transcrevendo do piano para cordas

SIMULANDO UM PEDAL

PIANO ORIGINAL

Musical score for piano original. The score is in 4/4 time. The right hand (treble clef) plays a melody of eighth notes: G4, A4, B4, C5, D5, E5, F5, G5. A fermata is placed over the final G5. The left hand (bass clef) plays a sustained bass note of G3, indicated by a fermata and the marking "Ped." below the staff.

TRÊS VERSÕES PARA CORDAS (tocadas sem pausa)



1

Musical score for string version 1. The score is in 4/4 time. Vln. 1 (treble clef) has a whole rest followed by a quarter rest, then a melody of eighth notes: G4, A4, B4, C5, D5, E5, F5, G5. Vln. 2 (treble clef) has a quarter rest, then a quarter note G4, followed by a melody of eighth notes: A4, B4, C5, D5, E5, F5, G5. Vla. (alto clef) has a quarter rest, then a quarter note G4, followed by a melody of eighth notes: A4, B4, C5, D5, E5, F5, G5. Vlc. (bass clef) has a whole note G3. D.B. (bass clef) has a whole note G3. The word "div." is written above the Vla. staff.

2

Musical score for string version 2. The score is in 4/4 time. Vln. 1 (treble clef) has a whole rest followed by a quarter rest, then a melody of eighth notes: G4, A4, B4, C5, D5, E5, F5, G5. Vln. 2 (treble clef) has a quarter rest, then a quarter note G4, followed by a melody of eighth notes: A4, B4, C5, D5, E5, F5, G5. Vla. (alto clef) has a quarter rest, then a quarter note G4, followed by a melody of eighth notes: A4, B4, C5, D5, E5, F5, G5. Vlc. (bass clef) has a quarter note G4, followed by a melody of eighth notes: A4, B4, C5, D5, E5, F5, G5. D.B. (bass clef) has a whole note G3. The word "div." is written above the Vlc. staff.

3

Musical score for string version 3. The score is in 4/4 time. Vln. 1 (treble clef) has a quarter rest, then a melody of eighth notes: G4, A4, B4, C5, D5, E5, F5, G5. Vln. 2 (treble clef) has a quarter rest, then a quarter note G4, followed by a melody of eighth notes: A4, B4, C5, D5, E5, F5, G5. Vla. (alto clef) has a quarter rest, then a quarter note G4, followed by a melody of eighth notes: A4, B4, C5, D5, E5, F5, G5. Vlc. (bass clef) has a whole note G3. D.B. (bass clef) has a whole note G3.

EXAMPLE 5-41. Schubert, "Rückblick," mm. 1-2

PIANO ORIGINAL

Nicht zu geschwind

Musical score for Piano Original. The score is in 3/4 time and B-flat major. It features a Voice part (treble clef) which is silent in these measures. The Piano part consists of two staves (treble and bass clefs). The right hand starts with a piano (*p*) dynamic, playing a rhythmic pattern of eighth notes with slurs. The left hand plays a bass line with eighth notes. The dynamic changes to *fp* (fortissimo piano) in the second measure, with a crescendo hairpin.

DUAS VERSÕES PARA CORDAS (tocadas sem pausa)

Musical score for two string versions (1 and 2) of Schubert's "Rückblick" mm. 1-2. Both versions are in 3/4 time and B-flat major. Version 1 is marked "Not too fast" and includes dynamics *p* and *fp*. It features a pizzicato (*pizz.*) section in the first measure followed by an arco section in the second measure. Version 2 is also marked "Not too fast" and includes dynamics *p* and *f*. It features a pizzicato (*pizz.*) section in the first measure followed by a section in the second measure. The string parts include Violin 1 (Vln. 1), Violin 2 (Vln. 2), Viola (Vla.), Violoncello (Vlc.), and Double Bass (D.B.).



EXAMPLE 5-42. Brahms, "An ein Veilchen," mm. 1-3

PIANO ORIGINAL

Andante

Voice

sehr zart (delicatamente)

p

Birg, o

The image shows the first three measures of the original piano and voice score for Brahms's 'An ein Veilchen'. The tempo is marked 'Andante'. The voice part is in a soprano clef with a treble clef and a key signature of one flat (B-flat major). The piano accompaniment consists of two staves, treble and bass clef, with a treble clef and a key signature of one flat. The piano part features a delicate, flowing melody in the right hand and a supporting bass line in the left hand. The first measure is a whole rest for the voice. The second measure is also a whole rest. The third measure contains the lyrics 'Birg, o' and features a half note G4 in the voice and a half note G4 in the piano right hand. The piano part is marked with a piano dynamic (*p*) and the instruction *sehr zart (delicatamente)*.

VERSÃO PARA CORDAS

Andante

Vln. 2

p

con sord.

Vla.

p

con sord.

Vlc.

p

con sord.

D.B.

p

The image shows the first three measures of the string version of 'An ein Veilchen'. The tempo is marked 'Andante'. The score is for four string parts: Violin 2 (Vln. 2), Viola (Vla.), Violoncello (Vlc.), and Double Bass (D.B.). All parts are in a 6/8 time signature and a key signature of one flat. The Violin 2 and Viola parts play a delicate, flowing melody, marked with a piano dynamic (*p*) and the instruction *con sord.* (con sordina). The Violoncello and Double Bass parts play a supporting bass line, also marked with a piano dynamic (*p*) and *con sord.*. The Violoncello part has a whole note G2 in the first measure, a whole note G2 in the second measure, and a whole note G2 in the third measure. The Double Bass part has a whole note G2 in the first measure, a whole note G2 in the second measure, and a whole note G2 in the third measure.



EXAMPLE 5-43. Brahms, "O liebliche Wangen," mm. 1-3

PIANO ORIGINAL

Lebhaft

Voice

O lieb - li - che Wan - gen, ihr macht mir Ver -

Piano

mf

The image shows the first three measures of the original piano and voice score. The music is in G major and 6/8 time. The tempo is marked 'Lebhaft'. The voice part has the lyrics 'O lieb - li - che Wan - gen, ihr macht mir Ver -'. The piano accompaniment features a melody in the right hand and a bass line in the left hand, with a mezzo-forte (*mf*) dynamic marking.



VERSÃO PARA CORDAS

Lively

Vln. 1

Vln. 2

Vla.

Vlc.

D.B.

mf

The image shows the first three measures of the string version of the piece. The music is in G major and 6/8 time, with a tempo marking of 'Lively'. The score includes staves for Violin 1 (Vln. 1), Violin 2 (Vln. 2), Viola (Vla.), Violoncello (Vlc.), and Double Bass (D.B.). The dynamics are marked mezzo-forte (*mf*).

PIANO ORIGINAL

Allegro agitato

Voice

Piano

pp

Monte, é - cu -

The image shows the first three measures of the original piano and voice score. The tempo is marked 'Allegro agitato'. The voice part is in a soprano clef with a common time signature. The piano part is in a grand staff with a common time signature. The piano part features a complex rhythmic pattern of sixteenth and thirty-second notes, with a dynamic marking of *pp*. The voice part has a melodic line that begins in the third measure with the lyrics 'Monte, é - cu -'. There are accents and slurs in the piano part.

VERSÃO PARA CORDAS

Allegro agitato

Vln. 1

Vln. 2

Vla.

Vlc.

D.B.

pp

pp

non div.

pp

pp

pp

The image shows the first three measures of the string version of 'L'Attente'. The tempo is marked 'Allegro agitato'. The score is for five string instruments: Violin 1, Violin 2, Viola, Violoncello, and Double Bass. All parts are in a common time signature. The Violin 1 and 2 parts have a dynamic marking of *pp*. The Viola part is marked 'non div.' and has a dynamic marking of *pp*. The Violoncello and Double Bass parts also have a dynamic marking of *pp*. The parts feature a complex rhythmic pattern of sixteenth and thirty-second notes, with accents and slurs.



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