

# ASTRA Project

un ponte tra Arte/Musica e Scienza/Tecnologia

Francesco De Mattia  
Conservatorio "A. Boito" di Parma

Conferenza GARR 2009, Network Humanitatis, Napoli 30 settembre—2 ottobre 2009



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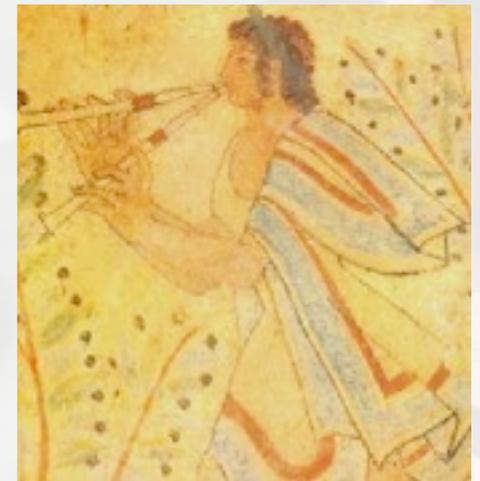




## il progetto

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- ... multidisciplinare, coinvolge archeologi, musicisti, fisici, informatici, ingegneri in una rete distribuita a livello internazionale



## il concetto di base

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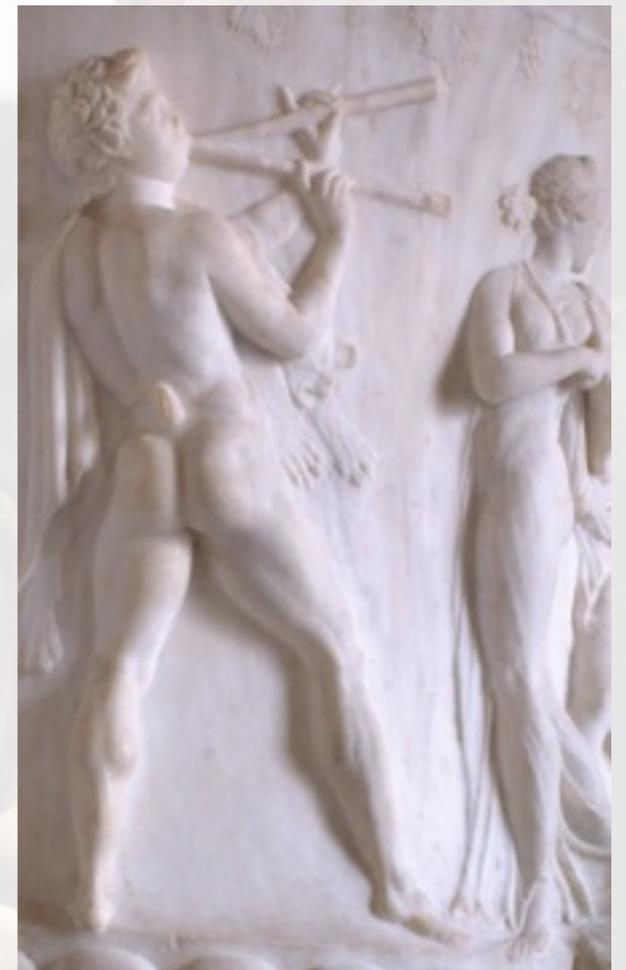
- partire dai ritrovamenti archeologici di antichi strumenti musicali per farli suonare ancora



## l'idea

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- ricreare un modello dello strumento e riprodurne il suono attraverso la simulazione delle sue caratteristiche meccaniche



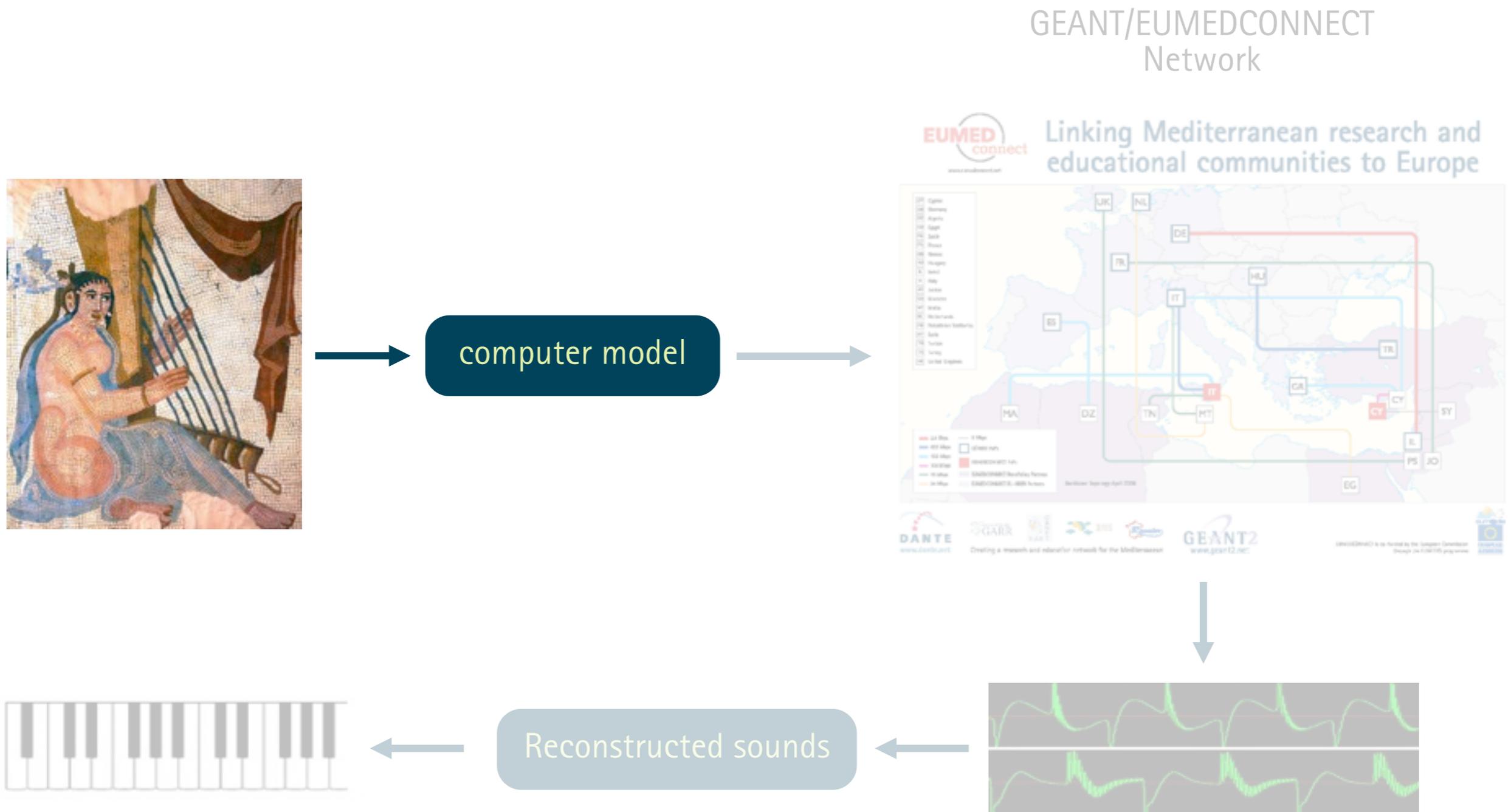
## equazioni ispirate dall'archeologia

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- la sintesi del modello fisico non è un concetto nuovo in acustica
- vengono utilizzate equazioni create da Hiller e Ruiz nel 1971
- è una tecnica molto intensiva dal punto di vista computazionale
- il loro uso pratico è stato reso possibile dallo spostamento di ASTRA su GRID

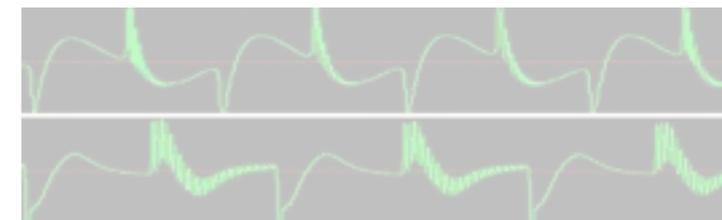
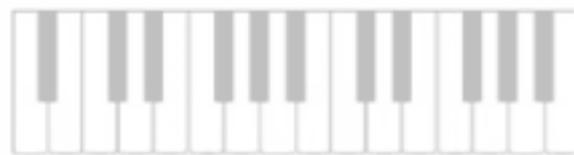
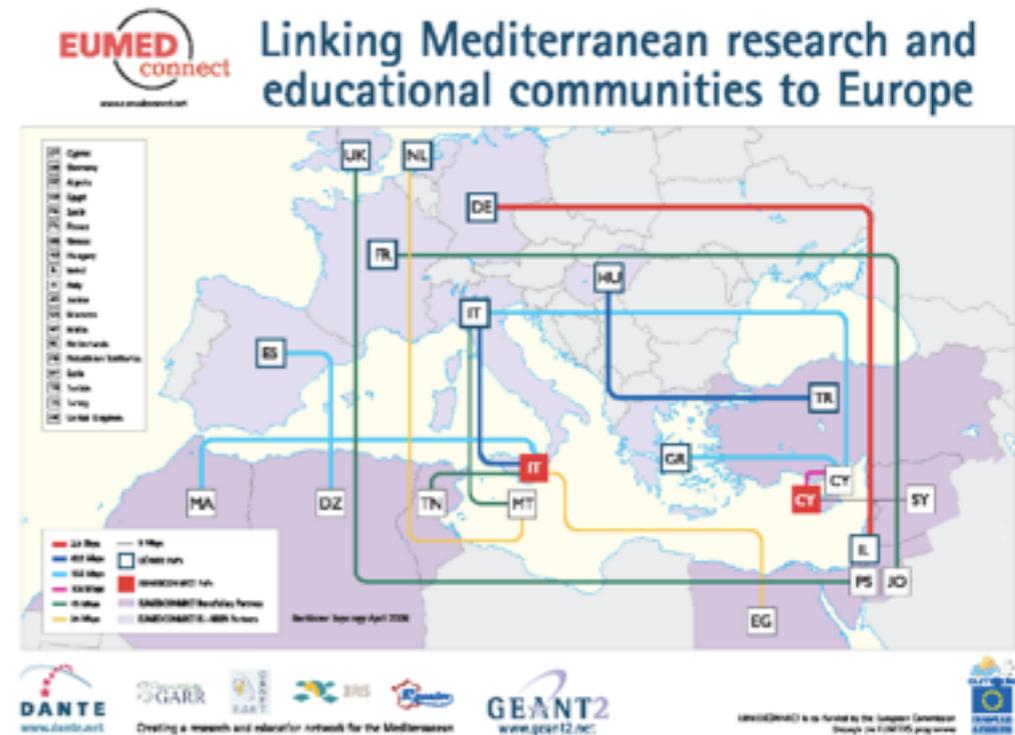


## flusso di lavoro /1



## flusso di lavoro /2

### GEANT/EUMEDCONNECT Network



# flusso di lavoro /3: GENIUS Grid Portal

Start a Demo

Step 1.

Please, select the ASTRA demo you want to run on the GILDA testbed.

Demo Selected

Start ASTRA de

01. Bach fugue played on a reconstructed Epigonion  
 02. Middle age piece (G. Dufay) played on 4 reconstructed Epigonion  
 03. Excerpt from a XVII Century piece (A. Banchieri) played on 4 reconstructed Epigonions  
 04. Excerpt from a XVII Century piece (D. Buxtehude) played on 3 reconstructed Epigonions  
 05. Excerpt from a XIX Century piece (F. Schubert) played on 3 reconstructed Epigonions

ASTRA Queue					
#	<a href="#">Globus JobID</a>	<a href="#">Last Update Time</a>	<a href="#">Status</a>	<a href="#">Destination</a>	<a href="#">Exit Code</a>
3	<a href="#">FM2hLB5qTmdnNkUDwx0kAA</a>	13:41:02 Fri Dec 26:	Done	iceage-ce-01.ct.infn.it:2119/jobmanager-lcgpbs-infinite	0
2	<a href="#">oVxjPE1fIkul1zJpuliVw</a>	13:33:59 Fri Dec 26:	Scheduled	grid010.ct.infn.it:2119/jobmanager-lcgpbs-infinite	
1	<a href="#">5GcS-h8Qs1-DkcxJVz0Gmw</a>	13:33:35 Fri Dec 26:	Scheduled	grid010.ct.infn.it:2119/jobmanager-lcgpbs-long	

# flusso di lavoro /3: GENIUS Grid Portal

ASTRA Services!

- [Start a Demo](#)
- [Job\(s\) Queue](#)
- [Clean Job\(s\) Queue](#)
- [Job\(s\) Data](#)
- [Back home](#)

**Start a Demo**

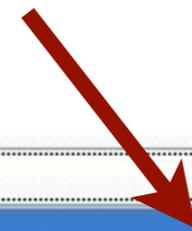
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## flusso di lavoro /3: GENIUS Grid Portal

ASTRA Services!

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### Start a Demo

Step 1.

Please, select the ASTRA demo you want to run on the GILDA testbed.

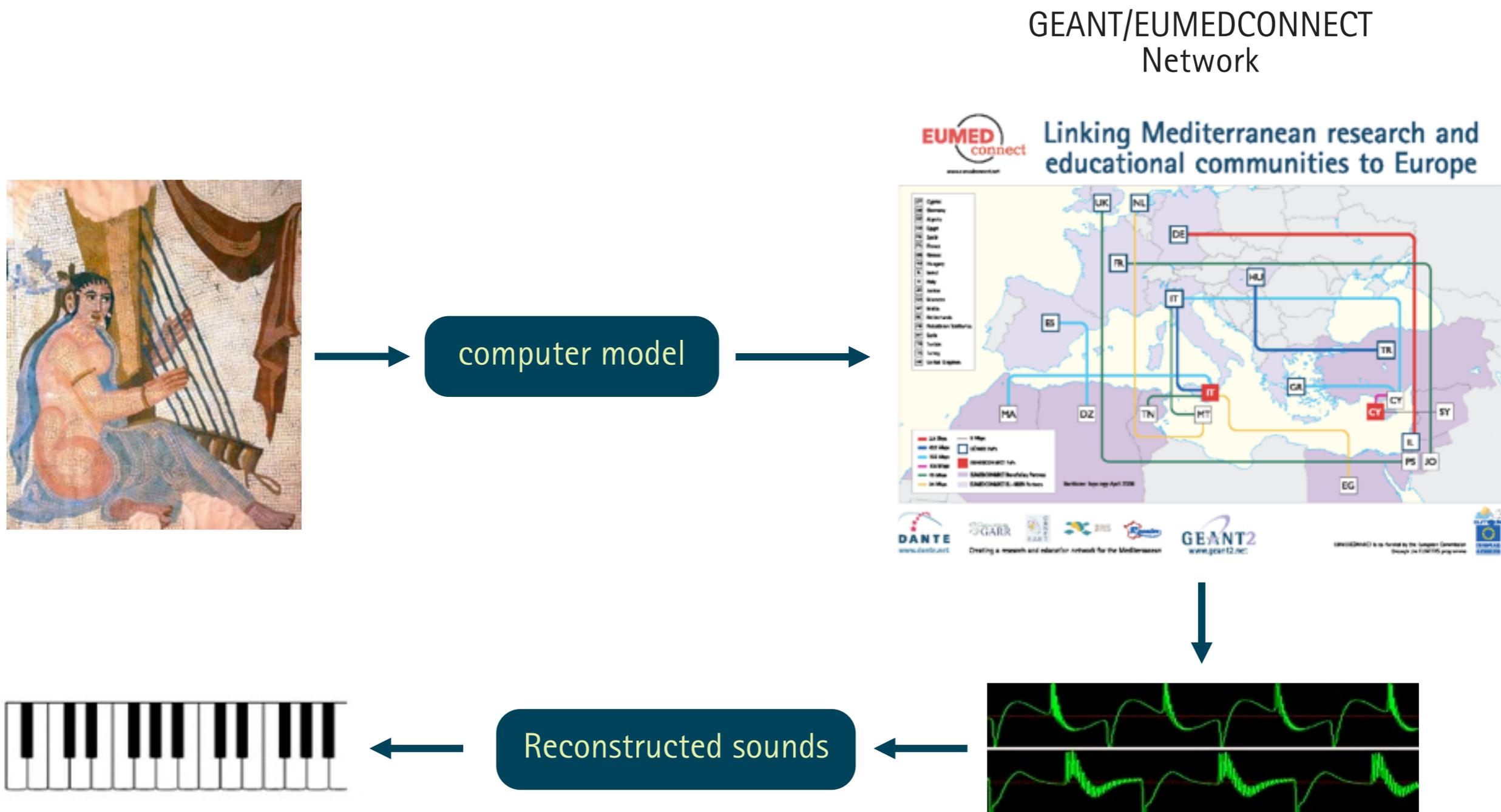
Demo Selected 01. Bach fugue played on a reconstructed Epigonion

Start ASTRA de 
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3	<a href="#">FM2hLB5qTmdnNkUDwx0kAA</a>	13:41:02 Fri Dec 26:	Done <input type="button" value="v"/>	iceage-ce-01.ct.infn.it:2119/jobmanager-lcgpbs-infinite	0
2	<a href="#">oVxjPE1fIkul1zJpuliVw</a>	13:33:59 Fri Dec 26:	Scheduled <input type="button" value="v"/>	grid010.ct.infn.it:2119/jobmanager-lcgpbs-infinite	
1	<a href="#">5GcS-h8Qs1-DkcxJVz0Gmw</a>	13:33:35 Fri Dec 26:	Scheduled <input type="button" value="v"/>	grid010.ct.infn.it:2119/jobmanager-lcgpbs-long	



## flusso di lavoro /4



## flusso di lavoro /4



## Epitaffio di Seikilos - I sec. d.C.

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Oson zes fainu,  
meden olossu lipu:  
pros oligon esti to zen  
to telos o cronos apai tei.

*Finché vivi sii gioioso,  
non rattristarti mai oltre misura:  
la vita dura poco  
e il Tempo esige il suo tributo.*

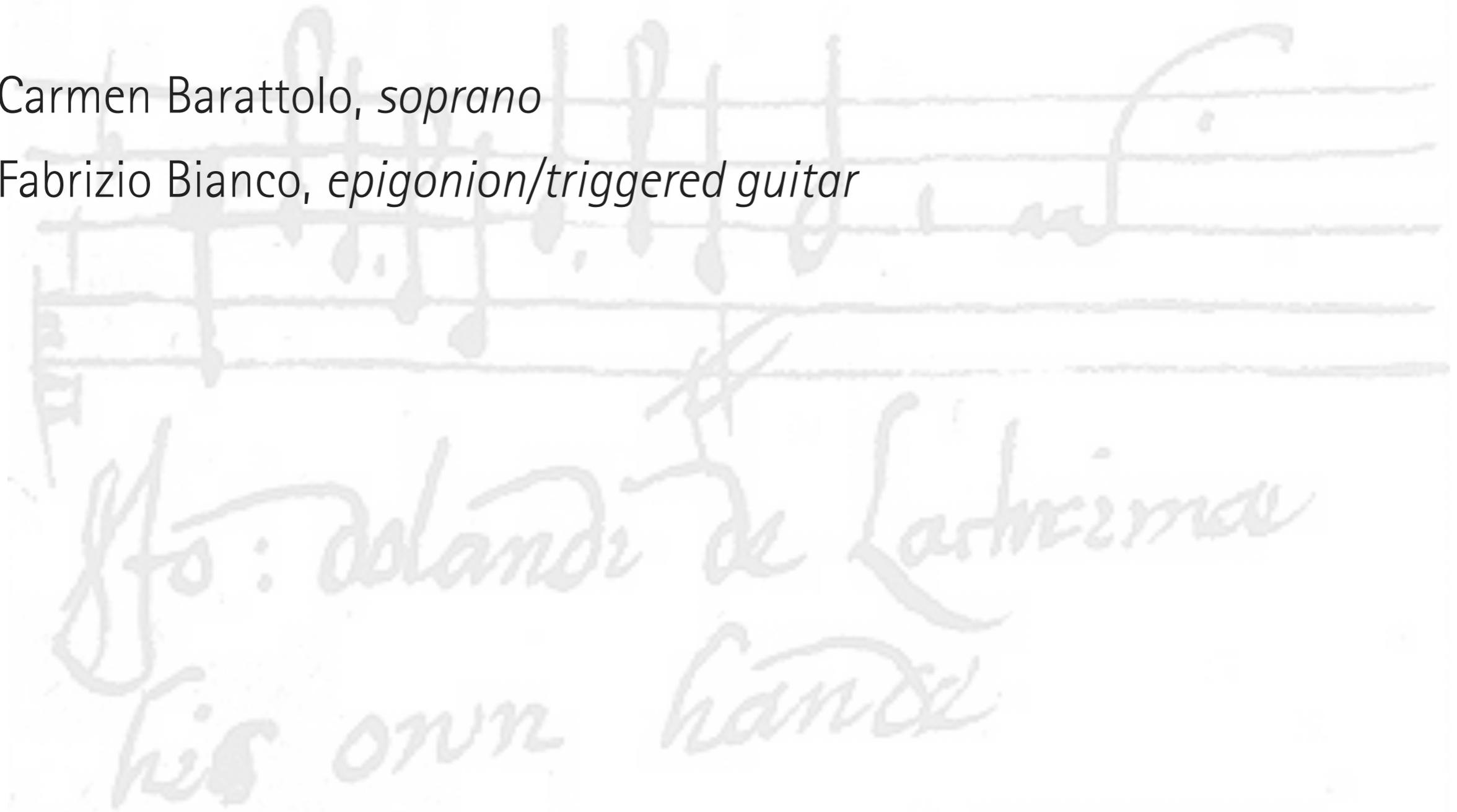
(Seikilos a Euterpe)



## J. Downland: *Come again*

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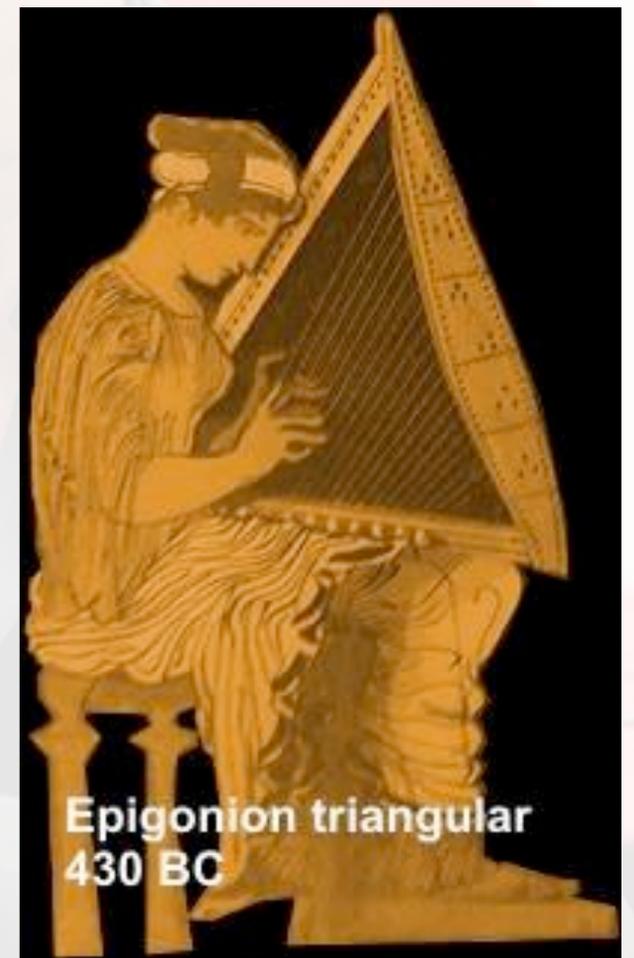
- Carmen Barattolo, *soprano*
- Fabrizio Bianco, *epigonion/triggered guitar*



## uno strumento ricostruito: l'epigonion

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- da settembre 2008, il suono dell'epigonion è finalmente disponibile
- è stato menzionato per la prima volta da Athenaeus nel 183 d.C.
- lo strumento, al quale Epigonus diede il proprio nome, aveva quaranta corde
- ad Epigonus fu data la cittadinanza onoraria di Sicyon per le grandi abilità musicali



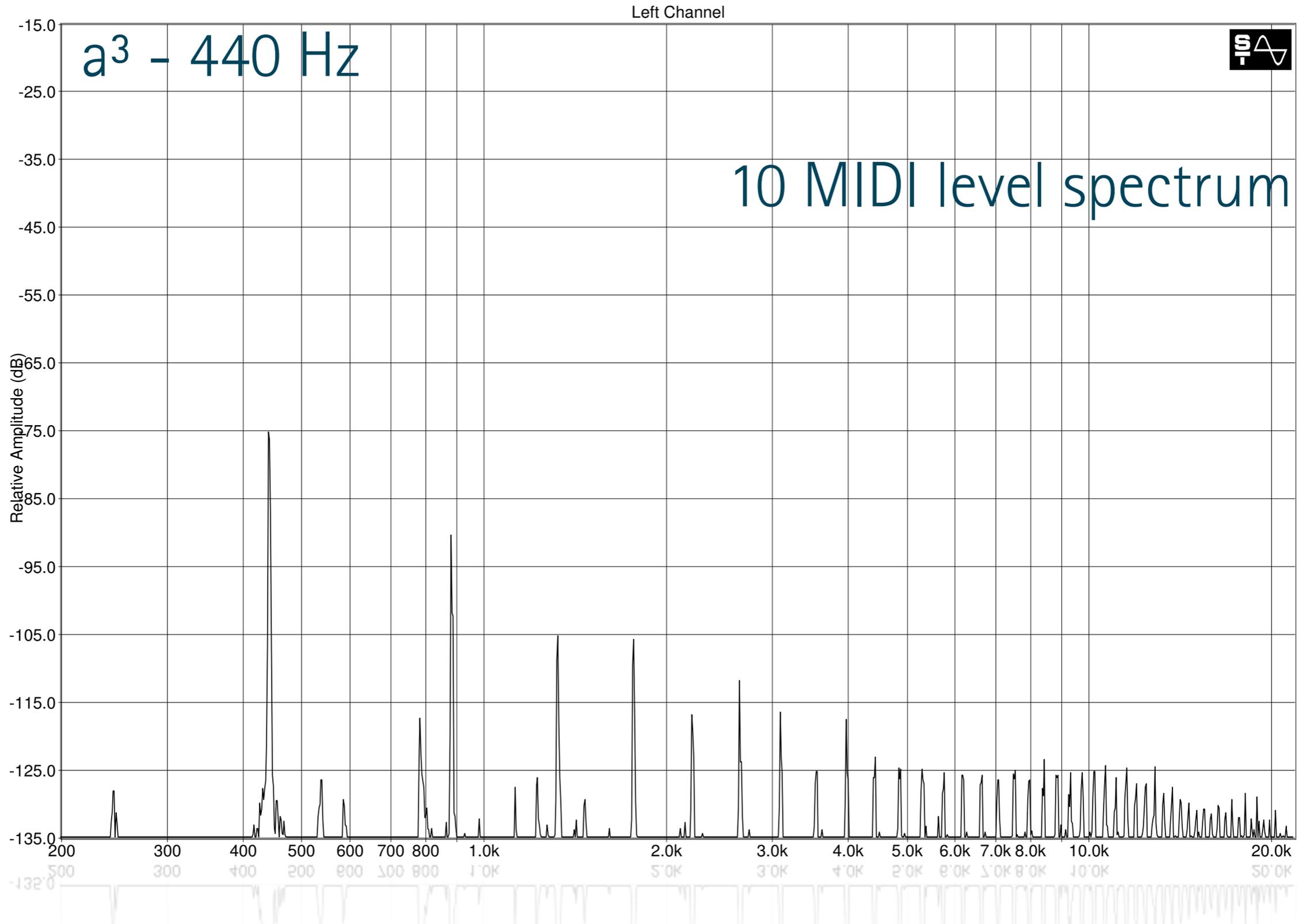
## campionamenti multipli per la dinamica

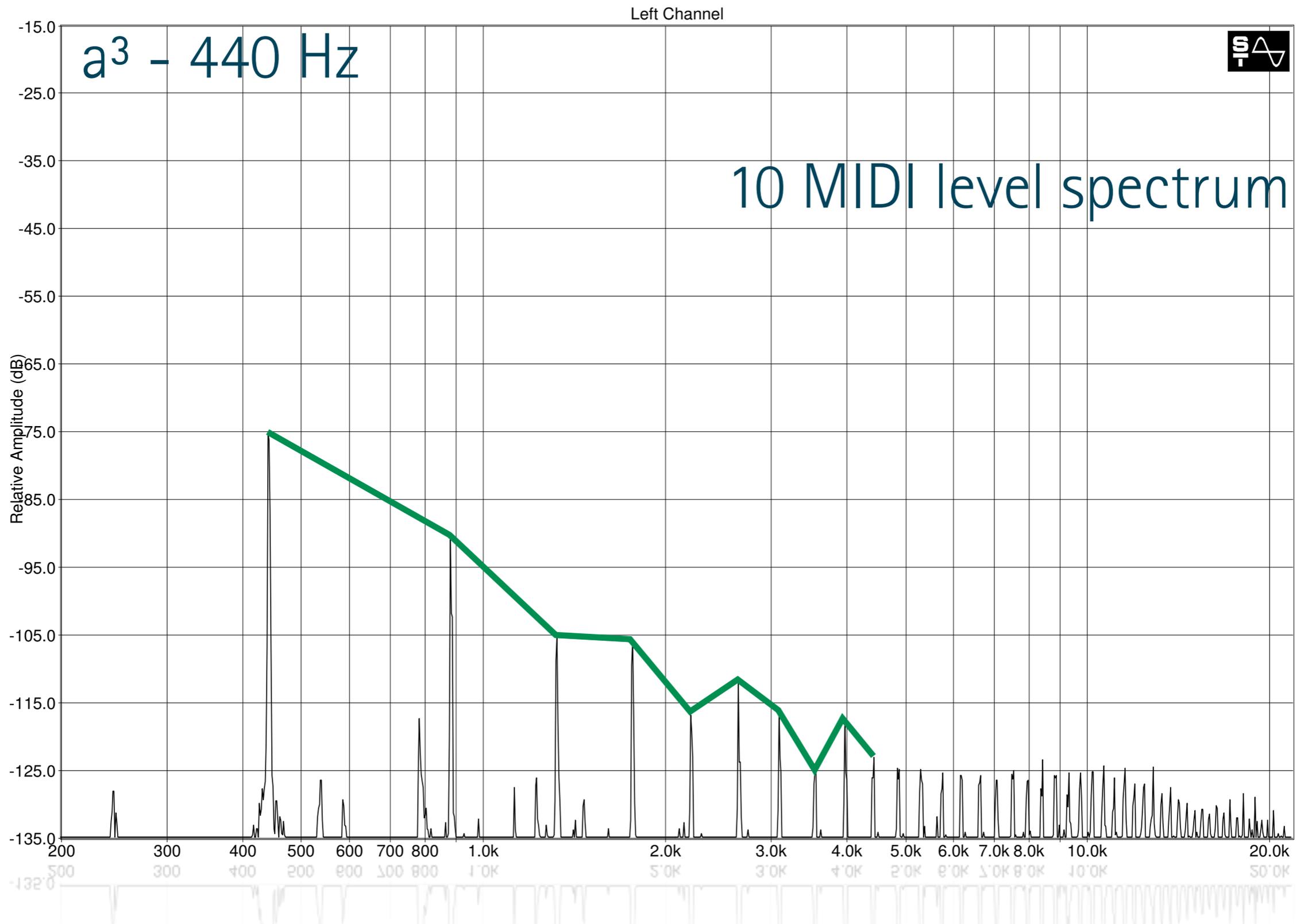
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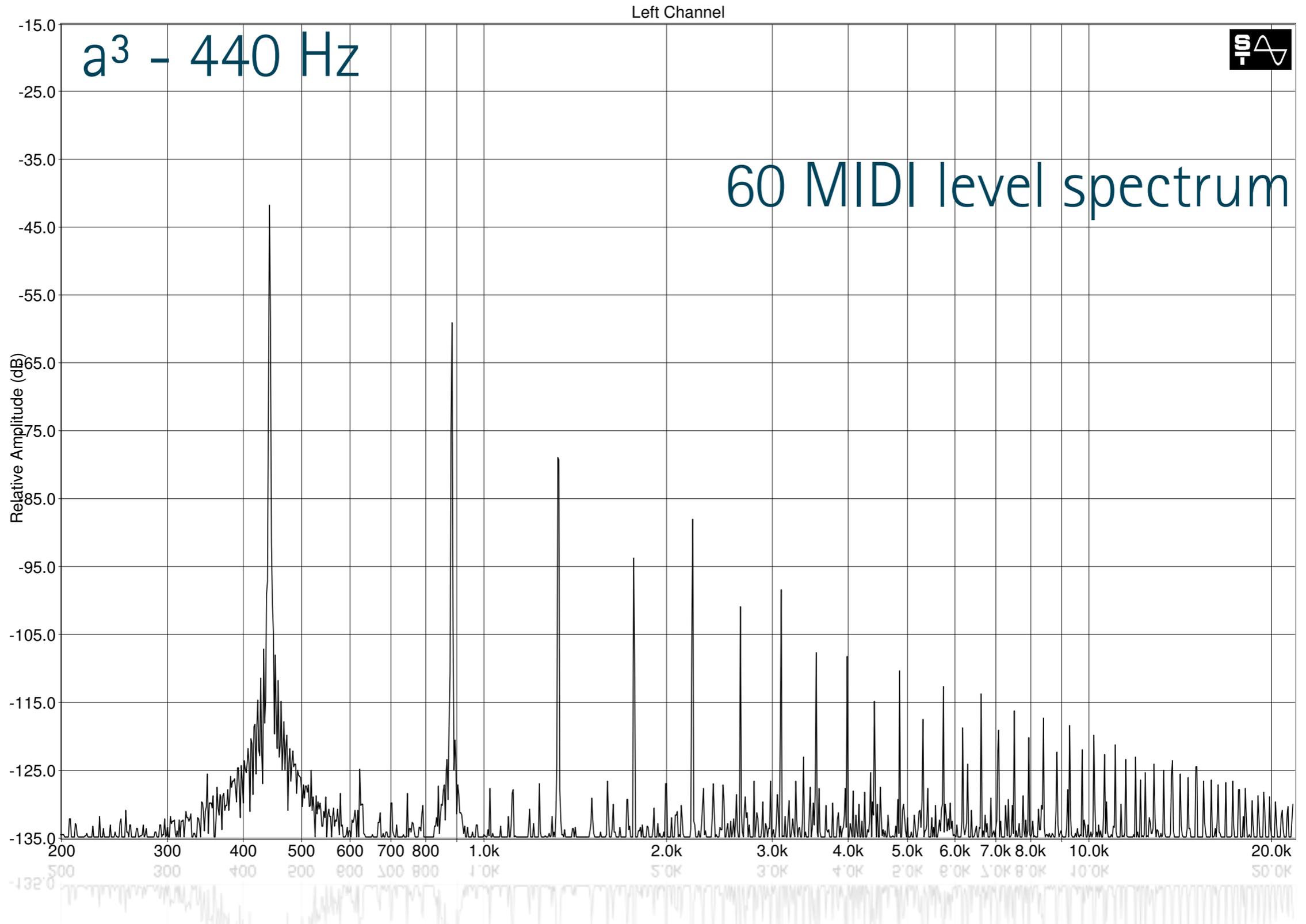
- sono stati generati per ogni nota 127 diversi campionamenti
- 7112 campioni, per un totale di circa 20 GBytes
- possibilità di dinamica durante l'esecuzione
- natural feeling dal punto di vista dell'esecutore
- lo spettro del suono cambia a seconda dell'intensità del tocco, come nello strumento reale
- Computation time:
  - circa 10 ore su GRID
  - più di 2700 ore su computer standard

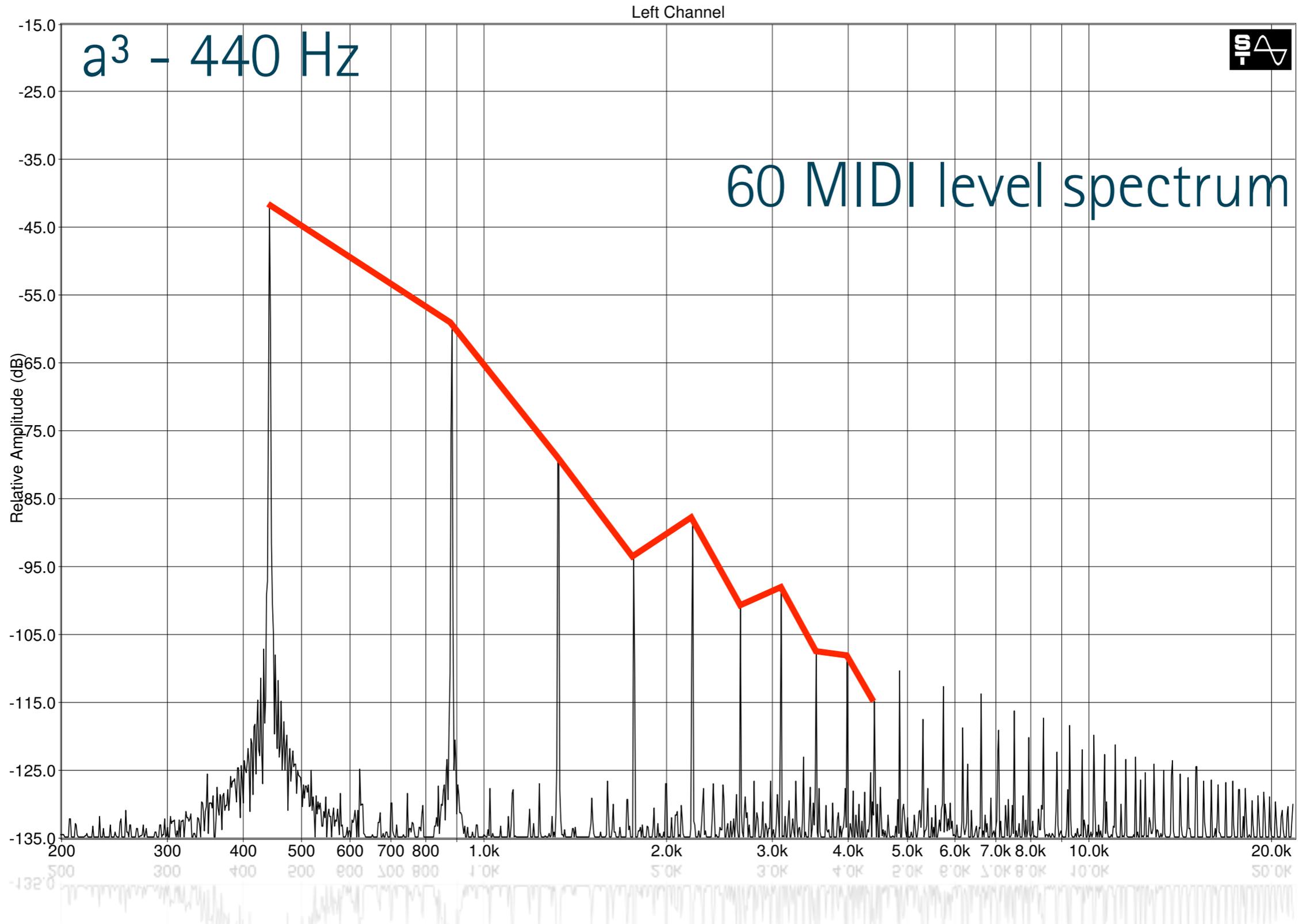
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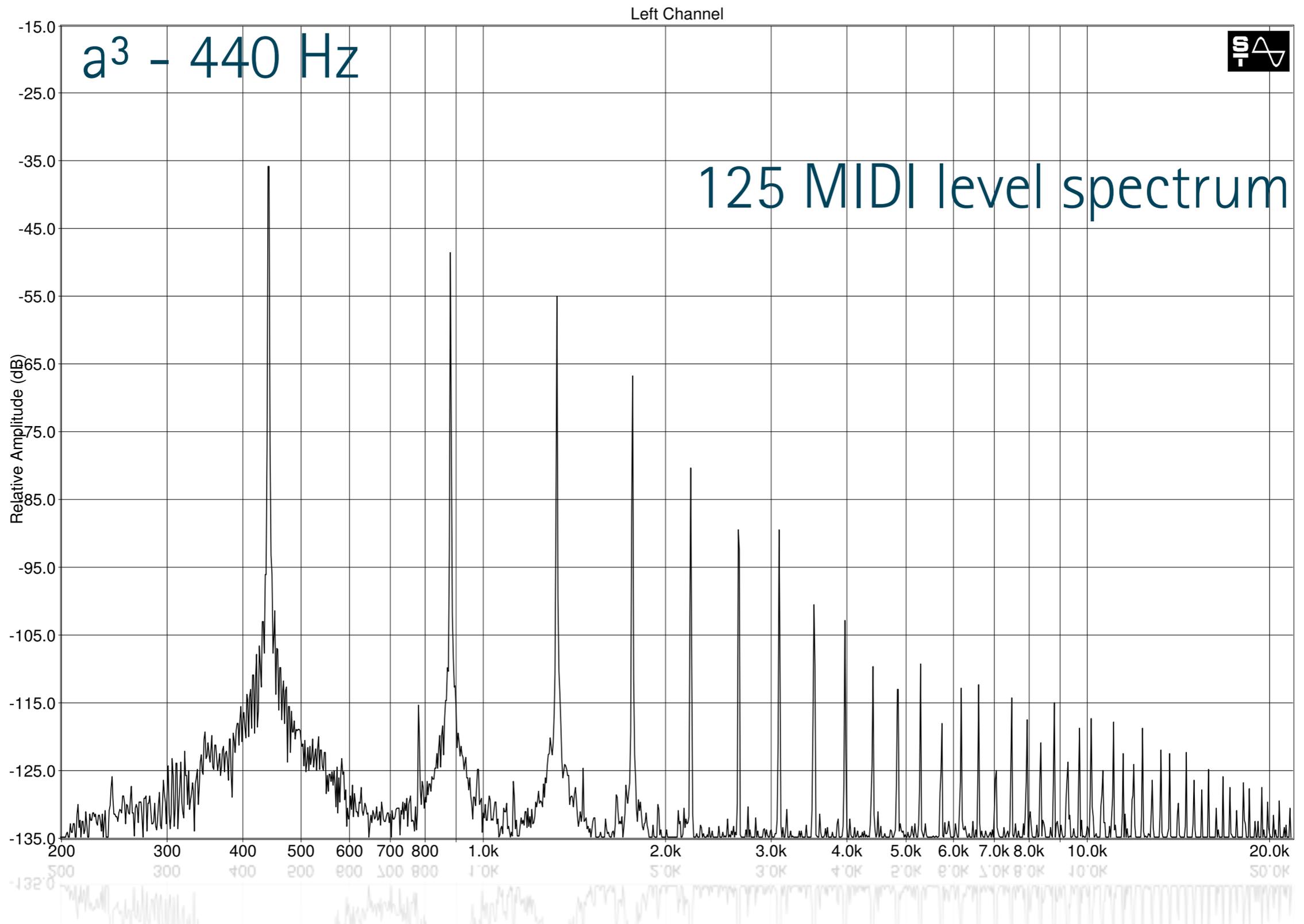


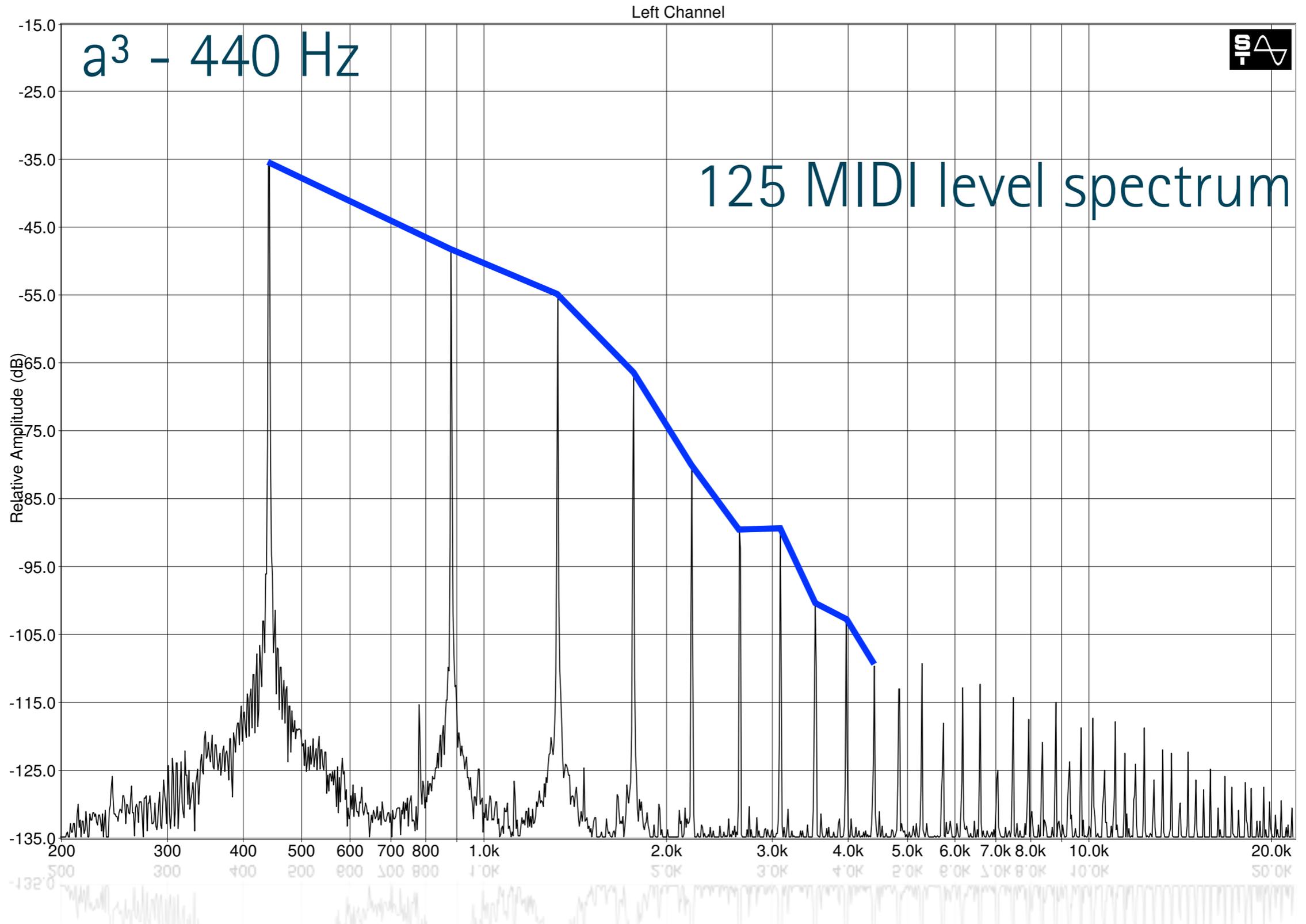


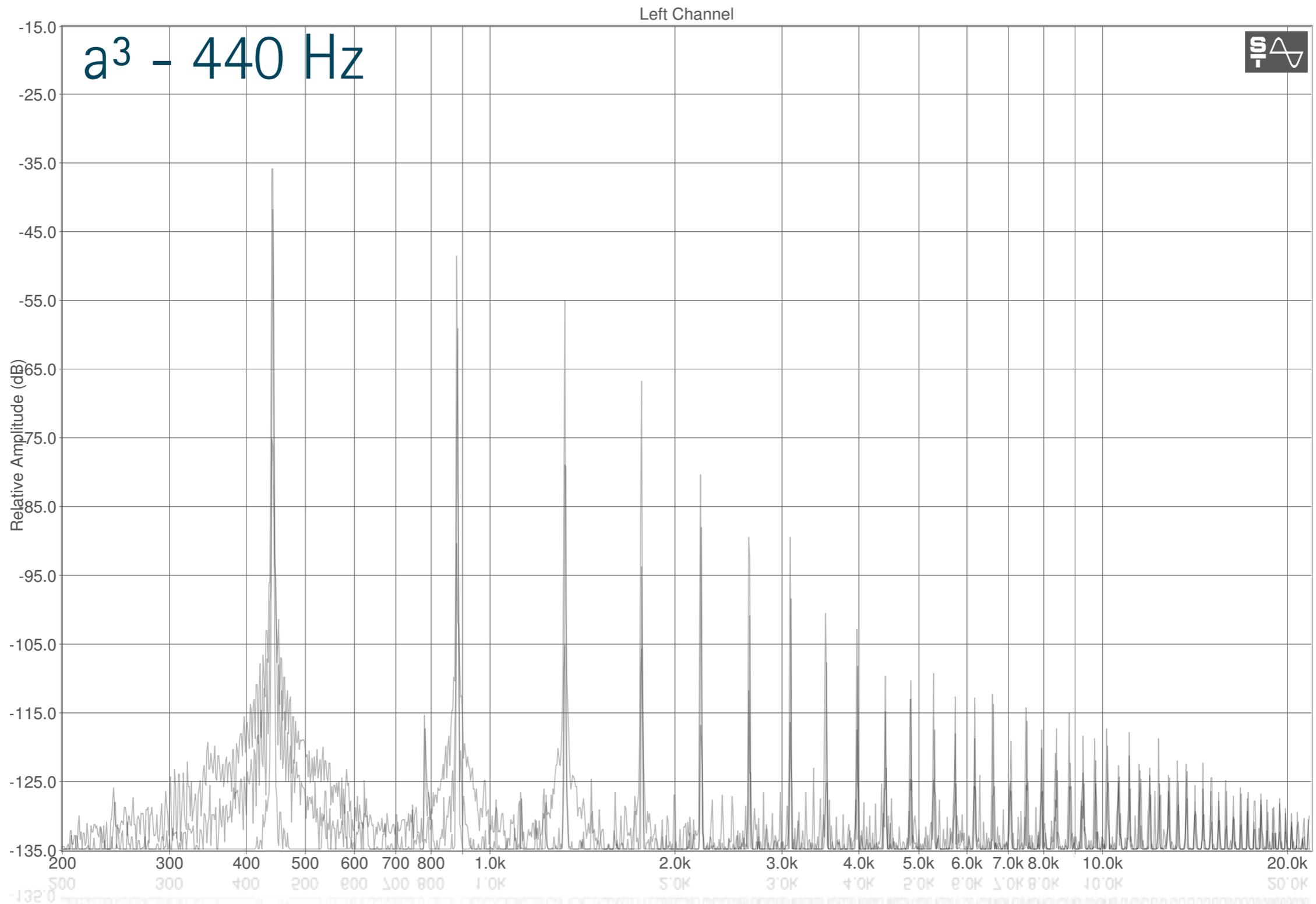


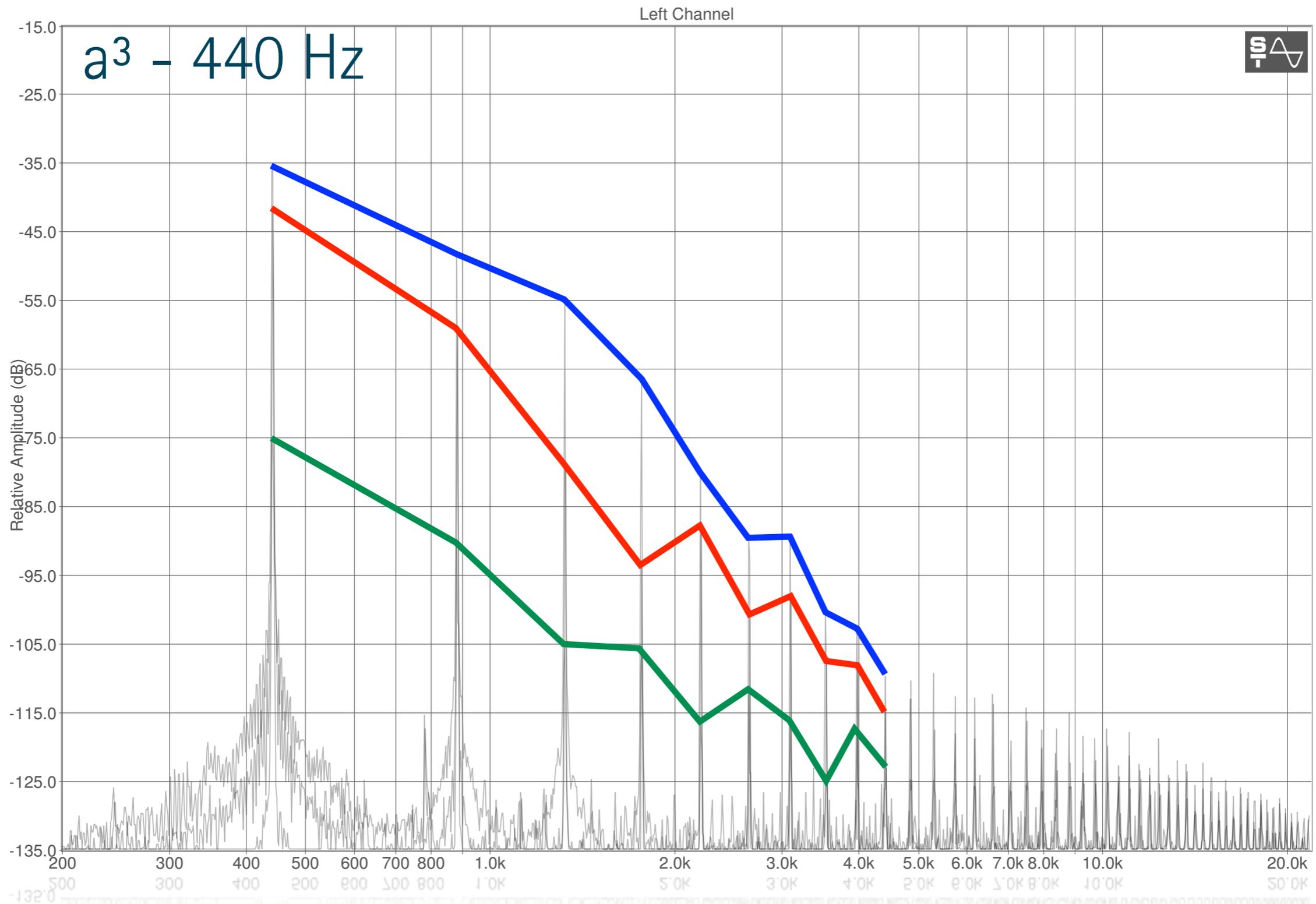








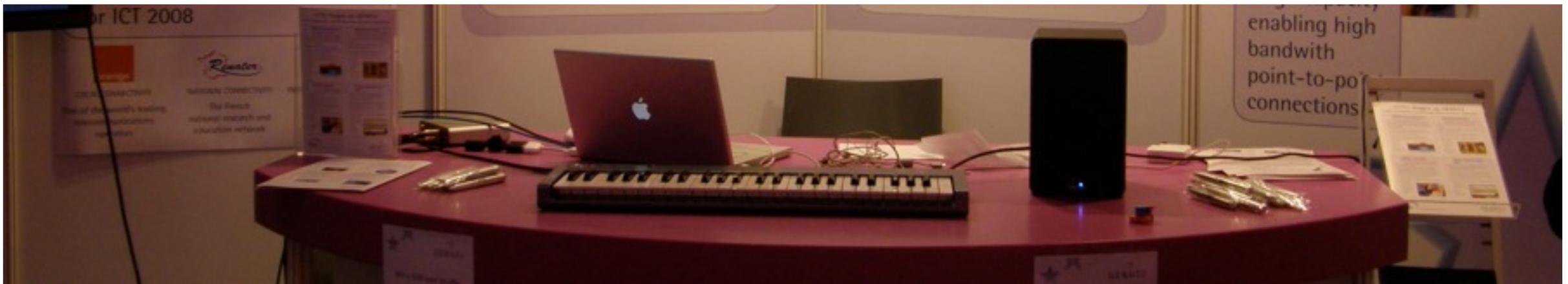




## Lost Sounds Orchestra

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- il suono dell'epigonion si fonde perfettamente con un ensemble di musica barocca, formato da archi e fiati
- tutti gli strumenti ricostruiti saranno suonati da uno speciale ensemble: **Lost Sounds Orchestra**, l'orchestra di ASTRA project
- si tratta della prima orchestra al mondo composta da soli strumenti ricostruiti su Grid



# Napoli, Festival Note d'Inverno, 14.12.2008, uSOB

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# Napoli, Festival Note d'Inverno, 14.12.2008, uSOB

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# Catania, Musica@Fisica, 26.6.2009

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# Proyecto ACHALAI

Acción Colaborativa de recuperación musical preHispánica Ancestral  
Armonizando Investigación y tecnología

in collaborazione con:



Univesidad  
de Chile



Univesidad  
Austral  
de Chile



Univesidad  
de  
La Serena

Univesidad  
de  
La Frontera





Reference Speaker  
Systems

## credits

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- ◉ **Domenico Vicinanza** *technical coordinator*
- ◉ **Francesco De Mattia** *artistic coordinator*
- ◉ **Salvatore Avanzo** *development coordinator*
- ◉ **Giuseppe La Rocca** *gridification coordinator*
- ◉ **Mariapaola Sorrentino** *testing and modelling coordinator*
  
- ◉ **Paolo Cimmino** *percussionist/researcher*
- ◉ **Leonardo Massa** *cellist/music therapist/researcher*

[www.astraproject.org](http://www.astraproject.org)  
[www.lostsoundsorchestra.org](http://www.lostsoundsorchestra.org)