Ivantsov filters and you
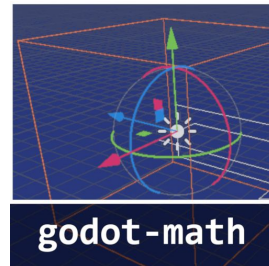
What's new in Dplug + some DSP banger technique

godot-math

What's new in Dplug

- **godot-math** port: replacement for **dplug:math**, can be used for widget rectangles and **dplug:canvas. Hand translation of Godot's math package.**
- **futureWidgetWheel,** mouse wheel support for widgets. This is an opt-in Option.
- **UISliderLogic:** helpful helper when you make you own sliders.
- **NEW TOOL: dbloat**: find largest functions in a Windows PDB.
  - latest Dplug make slightly smaller binaries now
- **NEW TOOL: all-plugins**: execute the same command in all your plugins sub-directories.

dbloat tool gives largest functions in .pdb

```
D:\auburn\offlabs\ivantsov>dbloat ivantsov-filters.pdb

*** OVERVIEW ***
  - ivantsov-filters.pdb has 9644 symbols.

*** REPARTITION ***
  - #other          688 symbols   92755 bytes
  - #msvc           592 symbols  112463 bytes (hidden)
  - #phobos         226 symbols   64805 bytes (hidden)
  - #druntime        96 symbols    9061 bytes (hidden)
  - #ldata         6728 symbols       0 bytes (hidden)
  - #undef            0 symbols       0 bytes
  - #gdata          218 symbols   12896 bytes (hidden)
  - #thunk           94 symbols     564 bytes (hidden)
  - #public         318 symbols       0 bytes (hidden)
  - #const          684 symbols       0 bytes (hidden)


*** TOP 10 LARGEST SYMBOLS ***
  7775 bytes main.MyPlug.processAudio #other
  4189 bytes dplug.vst2.client.VST2Client.dispatcher #other
  3061 bytes main.MyPlug.reset #other
  2468 bytes dplug.core.string.stb__clex_parse_number_literal #other
  1936 bytes dplug.vst2.client.VST2Client.this #other
  1910 bytes dplug.vst2.client.VST2Client.processDoubleReplacing #other
  1746 bytes dplug.vst2.client.VST2Client.processReplacing #other
  1544 bytes lfo.LFO.currentValue #other
  1449 bytes dplug.vst2.client.VST2Client.process #other
  1198 bytes dplug.client.client.Client.processAudioFromHost #other

D:\auburn\offlabs\ivantsov>
```

all-plugins tool execute the same command

```
D:\auburn\plugins>all-plugins -- make-manual
# Moving to sub-directory couture/
$ make-manual
Reading user-manual.xml
Adding chapter manual/foreword.md...
Adding chapter ../../misc/build-assets/chapters/installation.md...
Adding chapter manual/changelog.md...
Adding chapter manual/parameters.md...
Adding chapter manual/thanks.md...
Adding chapter ../../misc/build-assets/chapters/legal.md...
Writing Couture User's Guide.pdf
 => Written Couture User's Guide.pdf (3 mb)
# End sub-directory couture/
# Moving to sub-directory graillon/
$ make-manual
Reading user-manual.xml
Adding chapter manual/foreword.md...
Adding chapter ../../misc/build-assets/chapters/installation.md...
Adding chapter manual/changelog.md...
Adding chapter manual/parameters.md...
Adding chapter manual/thanks.md...
Adding chapter ../../misc/build-assets/chapters/legal.md...
Adding chapter ../../misc/build-assets/chapters/airwindows-graillon.md...
Writing Graillon 3 User's Guide.pdf
 => Written Graillon 3 User's Guide.pdf (3 mb)
# End sub-directory graillon/
# Moving to sub-directory innerpitch/
$ make-manual
```

Often you want to execute the same command for several similar projects.

(currently works for any type of subdirectory)

Required JSON in parent directory

```json
{
        "projects":
        [
                "couture",
                "graillon",
                "innerpitch",
                "lens",
                "panagement",
                "renegate",
                "selene"

        ]
}
```
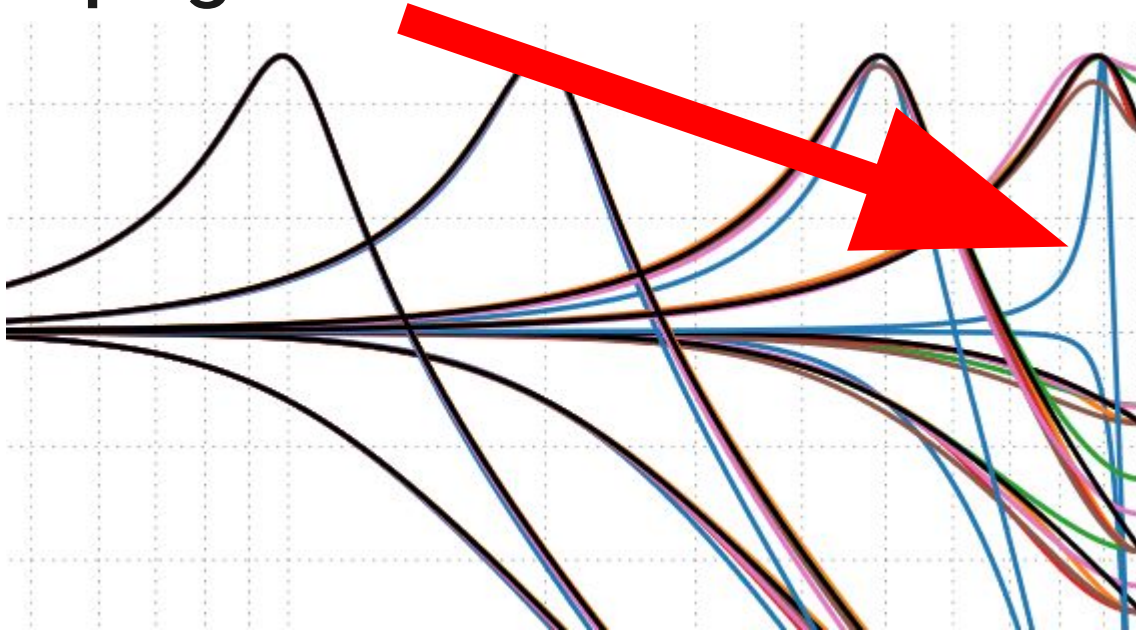
Normal RBJ biquads might destroy your high-end

- A phenomenon called "cramping"

- Particularly bad on high shelf, and anything that EQ high frequency, lowpass with cutoff frequency above 10kHz, etc.

Cramping

If you don't do anything special, then you probably get the cramped BLUE curve.

Effect:
- ugly phase shift
- thinning of Q
- cutoff hitting the "light speed" of Nyquist

■ **Yuriy Ivantsov**

On the Best Match of a Bilinear and Biquadratic Digital Filter, 2025-04-16 revised 2025-06-02. Paper.

Ivantsov designs are kind of a big deal

Source: https://ldesoras.fr/doc/articles/decramp-comp/

" In my opinion, the Ivantsov designs look really excellent. They are relatively accurate in the passband without major drawback, very fast to execute, cover almost all kinds of basic equalisation filters and only require single precision calculations. Some specialised and more accurate designs like Massberg for low-pass filters are worth consideration too, as well as designs accepting cutoff frequencies above Nyquist like Sierra. "
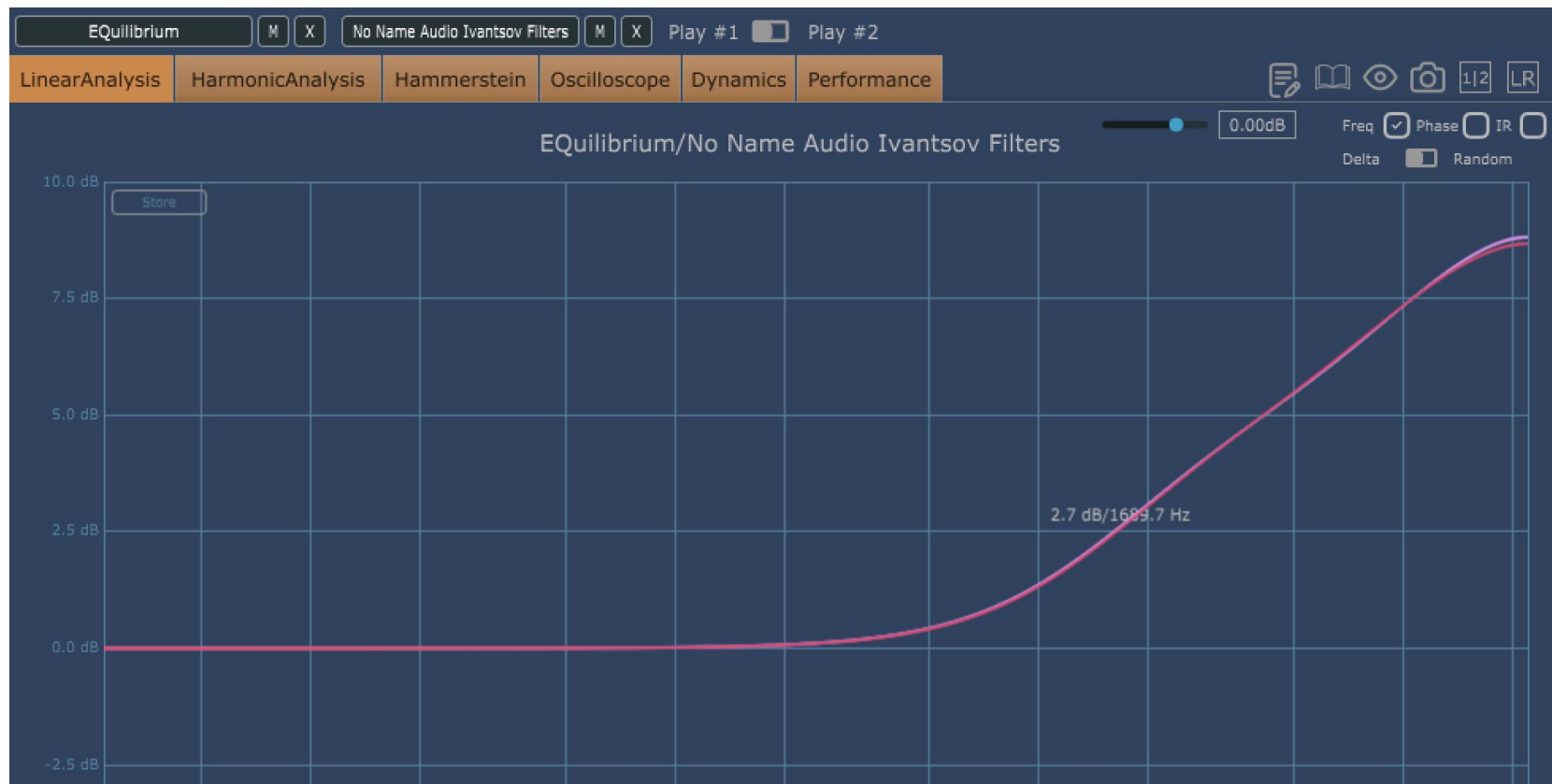
— Someone smart

A big list of positives

- ✅ Simple.
- ✅ Better behaviour than RBJ biquads when modulated, even with very fast modulation.
- ✅ As efficient as RBJ biquads, same number of derived filter types.
- ✅ Decramping **without** oversampling (typical in commercial EQs).
- ✅ Cutoff frequency can be above Nyquist.
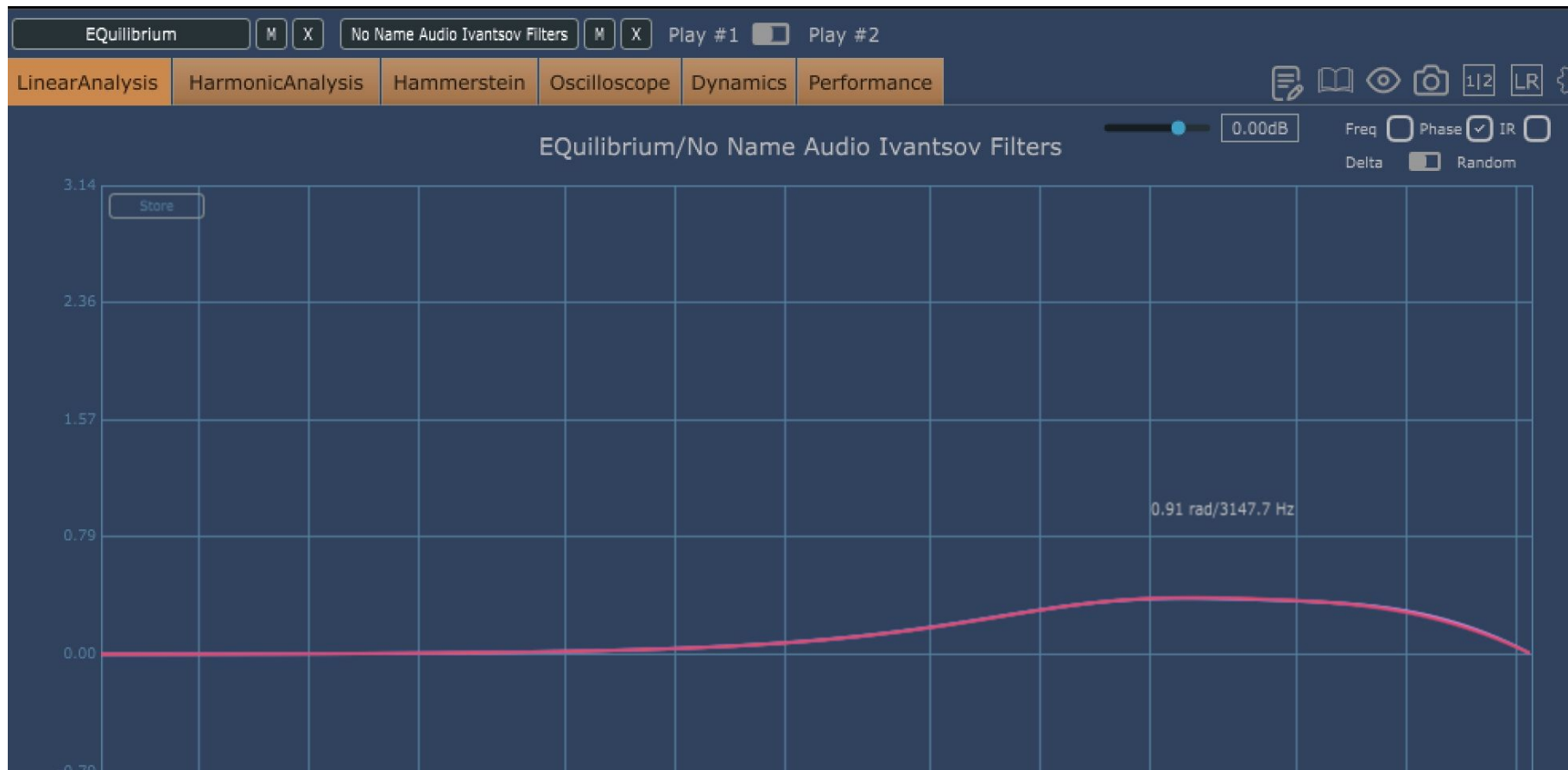
Source available at: https://github.com/yIvantsov/ivantsov-filters (MIT)

In my own tests

They are similar to DMG EQuilibrium "DMG" designs, which are **good**.

In my own tests

They are similar to DMG EQuilibrium "DMG" designs, which are **good**.

Available in D?

- I've translated it, but it's not in Dplug yet.
- Soon (™)
- Now everyone can have state of the art EQ with low complexity