

*Fast* **VDO**

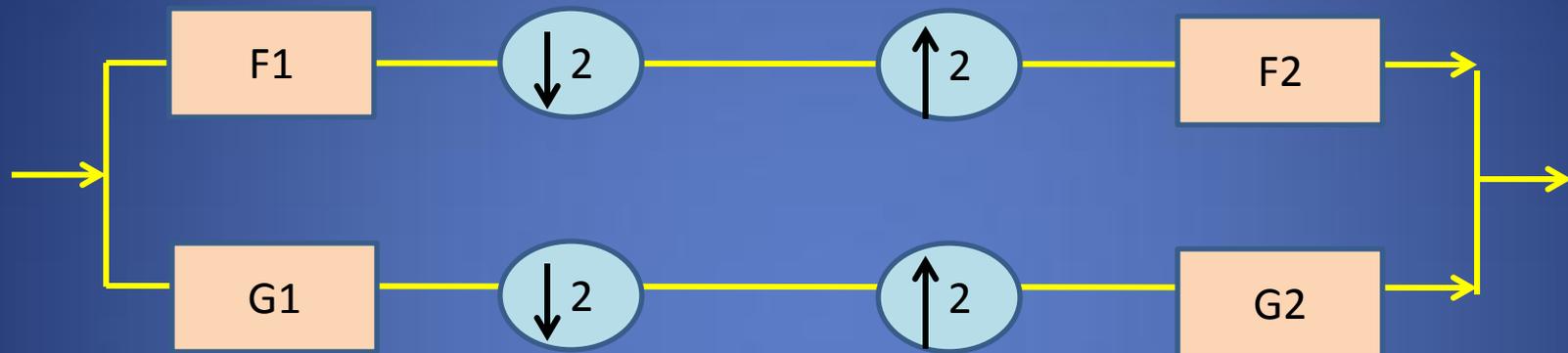
*like it's meant to be...*

# **JCT2-A0155: Sampling Filters for Depth Map Video for 3DV (CE3 Related)**

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# 2-Ch Perf Recon Filter Bank (PRFB)



- 2 Ch Perfect Recon Filter Banks
  - 1980s - Smart co-design of filters allow alias cancelation
  - 1990s – discover lifting based approaches
  - 2000 – JPEG2000

# Sampling = 1-Ch FB. PR?



- Sampling (down and up) is a 1-Ch FB
  - Perf Recon is no longer possible
  - But we can still cancel some aliasing!
  - Related to Laplace Pyramid; have lifting interpretation
- Moral: can do better than half-band filters

# Standard Half-Band Filters (SVC)

- Down
  - $\text{svc13} = [ 2 \ 0 \ -4 \ -3 \ 5 \ 19 \ 26 \ 19 \ 5 \ -3 \ -4 \ 0 \ 2 ] / 64$
- Up
  - $\text{Svc4} = [ -3 \ 19 \ 19 \ -3 ] / 32$

# FastVDO Anti-Alias Filters

- Down
  - $fv11 = [1 \ 0 \ -3 \ 0 \ 10 \ 16 \ 10 \ 0 \ -3 \ 0 \ 1] / 32$
- Up
  - $fv4 = [-1 \ 5 \ 5 \ -1] / 8$

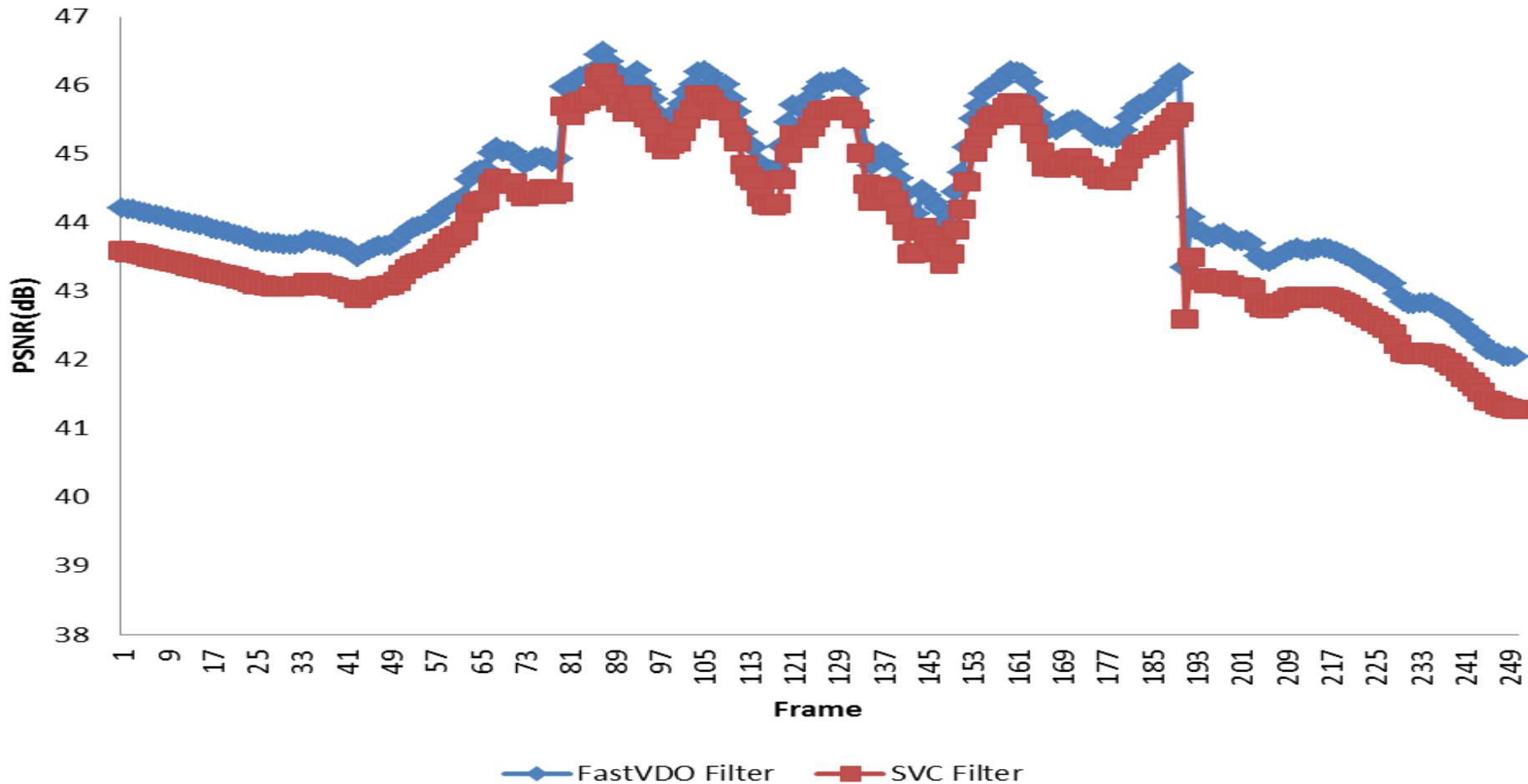


# Tests: Outperforms SVC Filters

- Consistent 0.7 – 1.2 dB gain in all test seqs
  - Outperforms SVC on every frame!
- Wide application in many domains
  - Spatial scalability
  - Adaptive Resolution Coding (ARC)
  - Adaptive Chroma Coding (ACC)
  - 3DV (depth map coding)



# Application Example: Depth Map\*



\*Dancer sequence



# Results

- Systematic gains against half-band filters
  - 0.7 – 1.2 dB observed in our tests
  - Same or lower complexity filters
- Suited for depth map and video

# Conclusion

- Powerful spatial sampling filters
- Benchmark for depth map sampling
- Request testing in CE3