1068-42-315 **David Jimenez** (djimenez@math.uh.edu), Department of Mathematics, University of Houston, 651, Phillip G. Hoffam Hall, Houston, TX 77204-3008, and **Manos Papadakis*** (mpapadak@math.uh.edu), Department of Mathematics, University of Houston, 651, Phillip G. Hoffam Hall, Houston, TX 77204-3008. *The Effect of Filtering Directional Bias on Analog to Digital Conversion in Multidimensions.* Preliminary report.

Digital filters for 2D or 3D-images are generated as the Fourier transforms of square-integrable $\mathbb{Z}^d$-periodic functions $(d = 2, 3)$. Depending on the variability of the decay rate of the filter's Fourier transform, which we call directional bias of the filter, the reconstruction errors of the input image, say f, may vary. This variation also depends on the rotations of the input image. More specifically, we study the effects on the truncation error $E_N(f) = inf_I\{||f - \sigma_I(f)|| : I \subset \mathbb{Z}^d, |I| \leq N\}$ of the directional distribution of the decay of $\hat{\psi}$ and $\hat{\phi}$, where $\sigma_I(f)(x) = \sum_{n \in I} < f, \psi(\cdot - n) > \phi(x - n)$, ϕ is the reconstruction kernel and ψ is the analysis kernel.

We demonstrate the effect of the directional distribution of the decays of the analysis and synthesis kernels on the construction of artifact-free synthetic dendritic arbors used as phantoms for the benchmarking the accuracy of neuroscience imaging software. These synthetic data are part of joint work with P.H. Herrera and I.A. Kakadiaris. (Received January 20, 2011)