

Direct synthesis of waveform integrals followed by differentiation, as can be done for a sawtooth wave by synthesizing piecewise parabola, seems to work well for limiting the aliasing.

Some questions. Does this work for a square wave, by differentiating a triangle?

And, is it possible to modify the technique to implement anti-aliased static nonlinear saturation, which for high gain factors suffers from similar problems.

I don't see how to directly synthesize the time integral of such a non-linearity. For a non-linearity $\sigma(x)$, operating on a sequence $y_n = \sigma(x_n)$, this would boil down to generating the integral directly, or

$$z_{n+1} = y_n + z_n = \sigma(x_n) + \sigma(x_{n-1}) + \dots$$

which doesn't seem to make much sense.