

# Frequency Response of Savitzky-Golay filters

SAVGOL(2, 2, 0, 0) is just a boxcar:

$$\blacksquare y = 0.2 + 2 (0.2 \cos (x) + 0.2 \cos (2x) )$$

SAVGOL(2, 2, 0, 2):

$$\blacksquare y = 0.485714 \\ + 2 (0.342857 \cos (x) - 0.0857143 \cos (2x) )$$

SAVGOL(4, 4, 0, 2):

$$\blacksquare y = 0.255411 + 2 (0.233766 \cos (x) \\ + 0.168831 \cos (2x) + 0.0606061 \cos (3x) \\ - 0.0909091 \cos (4x) )$$

SAVGOL(4, 4, 0, 4):

$$\blacksquare y = 0.41725 + 2 (0.314685 \cos (x) \\ + 0.06993 \cos (2x) - 0.128205 \cos (3x) \\ + 0.034965 \cos (4x) )$$

SAVGOL(4, 4, 0, 6):

$$\blacksquare y = 0.619265 + 2 (0.304585 \cos (x) \\ - 0.152287 \cos (2x) + 0.0435073 \cos (3x) \\ - 0.00543785 \cos (4x) )$$

Nyquist frequency:

$$\blacksquare |x| = \pi$$

