APPENDIX A
THE FUNCTION FIR1

\begin{verbatim}
function [b,a] = fir1(N,Wn,varargin
.FIR1   FIR filter design using the window method
B = FIR1(N,Wn) designs an N'th order lowpass FIR digital filter
% and returns the filter coefficients in length N+1 vector B
% The cut-off frequency Wn must be between 0 < Wn < 1.0, with 1.0
% corresponding to half the sample rate. The filter B is real and
% has linear phase. The normalized gain of the filter at Wn is
% dB 6-

.B = FIR1(N,Wn,'high') designs an N'th order highpass filter
% You can also use B = FIR1(N,Wn,'low') to design a lowpass filter
% If Wn is a two-element vector, Wn = [W1 W2], FIR1 returns an
% order N bandpass filter with passband W1 < W < W2. You can
% ,[also specify B = FIR1(N,Wn,'bandpass'). If Wn = [W1 W2
% .B = FIR1(N,Wn,'stop') will design a bandstop filter
% ,If Wn is a multi-element vector
% ,[Wn = [W1 W2 W3 W4 W5 ... WN
% FIR1 returns an order N multiband filter with bands
% .W < W1, W1 < W < W2, ..., WN < W < 1 > 0
% .B = FIR1(N,Wn,'DC-1') makes the first band a passband
% .B = FIR1(N,Wn,'DC-0') makes the first band a stopband
% B = FIR1(N,Wn,WIN) designs an N-th order FIR filter using
% the N+1 length vector WIN to window the impulse response
% If empty or omitted, FIR1 uses a Hamming window of length N+1
% For a complete list of available windows, see the help for the
% WINDOW function. KAISER and CHEBWIN can be specified with an
% optional trailing argument. For example, B =
% ((FIR1(N,Wn,kaiser(N+1,4
% uses a Kaiser window with beta=4. B =
% ((FIR1(N,Wn,'high',chebwin(N+1,R
% uses a Chebyshev window with R decibels of relative sidelobe
% .attenuation
% For filters with a gain other than zero at Fs/2, e.g., highpass
% and bandstop filters, N must be even. Otherwise, N will be
% incremented by one. In this case the window length should be
% .specified as N+2
% By default, the filter is scaled so the center of the first pass
% band has magnitude exactly one after windowing. Use a trailing
% 'noscale
%(argument to prevent this scaling, e.g. B = FIR1(N,Wn,'noscale
% B = FIR1(N,Wn,'high','noscale'), B = FIR1(N,Wn,wind,'noscale').
% You can also specify the scaling explicitly, e.g. FIR1(N,Wn,'scale'),
% etc
% ,See also KAISERORD, FIRCLS1, FIR2, FIRLS, FIRCLS, CFIRPM
% .FIRPM, FREQZ, FILTER, WINDOW
\end{verbatim}