**Steps for filtering Magnetic Susceptibility Data**

Donna Blackman 15 Dec 2015, updated 28 Jan 2016

Both WRMSL and SHMSL measurements are biased when obtained too close to piece edges. The edge bias distance is different for the two tools: 4 cm, for whole-round magnetic susceptibility, and 1 cm GRA density and point magnetic susceptibility. A Matlab routine, ***filtMSdL.m***, was written to use the SHMSL laser profile data to determine gaps and piece edges and to filter out data taken within the bias distance for each tool. Prior to running the routine, data must be downloaded from LIMS and formatted so that a unix script and Matlab can read the data. ***filtMSLd*** outputs the filtered MS data as a function of section depth and mbsf for both the loop (WRMSL) and point (SHMSL) data. A plot of all information for each section is also created, so that the small number of places that the algorithm logic cannot handle can be edited by hand.

For the current Matlab code in ***filtMSLd***, LIMS csv output needs to have line feeds turned into Unix-readable type. During Exp 360, TextWrangler on Mac was used, selecting UNICODE (UTF-8) and Unix (LF). Alternatively, the Matlab code could be updated to read the spreadsheet directly.

Unix awk script ***getprofms*** extracts depth and profile, whole round (MSL), and point MS (MSpt) values into each of 3 files for each section. For each section the profile filename is cut/paste into the script (line 1) and the core & section number are updated (values of $4 and $6 for MSL and MSpt files, lines 2 and 3 in script).

Then ***filtMSLd*** is run. Profile filename is pasted in when 'section' prompt comes up. Plot and output files are created and plot is displayed. Folder 'fplt' must exist so that plot files can be stored there.

Several sections were run through these steps at a given time and then results for each section in the suite were checked with the plots by hand editing GRA, MSL and MSpt files and then pasting the filtered MSptvalues into PhysProps spread sheet.

>> If there are no gaps detected, as was rarely the case during high

recovery intervals, the algorithm is not robust-

can run just the edge detection portion of the code after copying

the raw data onto an inital filtered variable (sd, sm, smp).