

## Application of LOG10 Transformation of Total Field Magnetic Data

Based On: Enhancement Of Magnetic Data By Logarithmic Transformation.

Bill Morris, Matt Pozza, And Joe Boyce, McMaster University, Hamilton, Ontario, Canada, George Leblanc, Canada Centre For Aerospace Research, National Research Council, Ottawa, Ontario. The Leading Edge August 2001

east	north	TMI	TMI-average(TMI)	acc=.1nT	Morris log transform
48650	47550	-151.428	-151.419	-1514.19	-3.18
48679.32	47550	-36.3753	-36.3654	-363.654	-2.56

See Morris et al. for details: Excel format of the transform equation in column "Morris log transform":

$$=IF(E2>1,LOG10(E2),IF(E2<1,-LOG10(ABS(E2)),0))$$

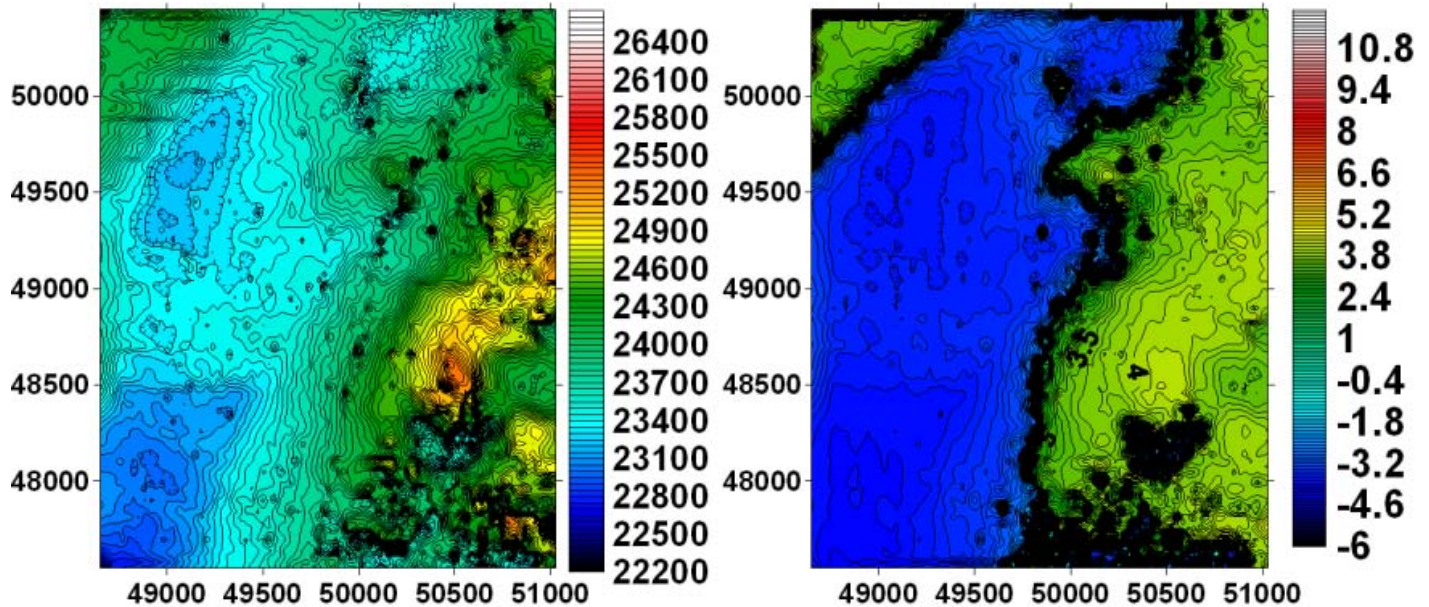


Figure 1. Left is original TMI, right is TMI contoured with Morris et al. (2001) technique.

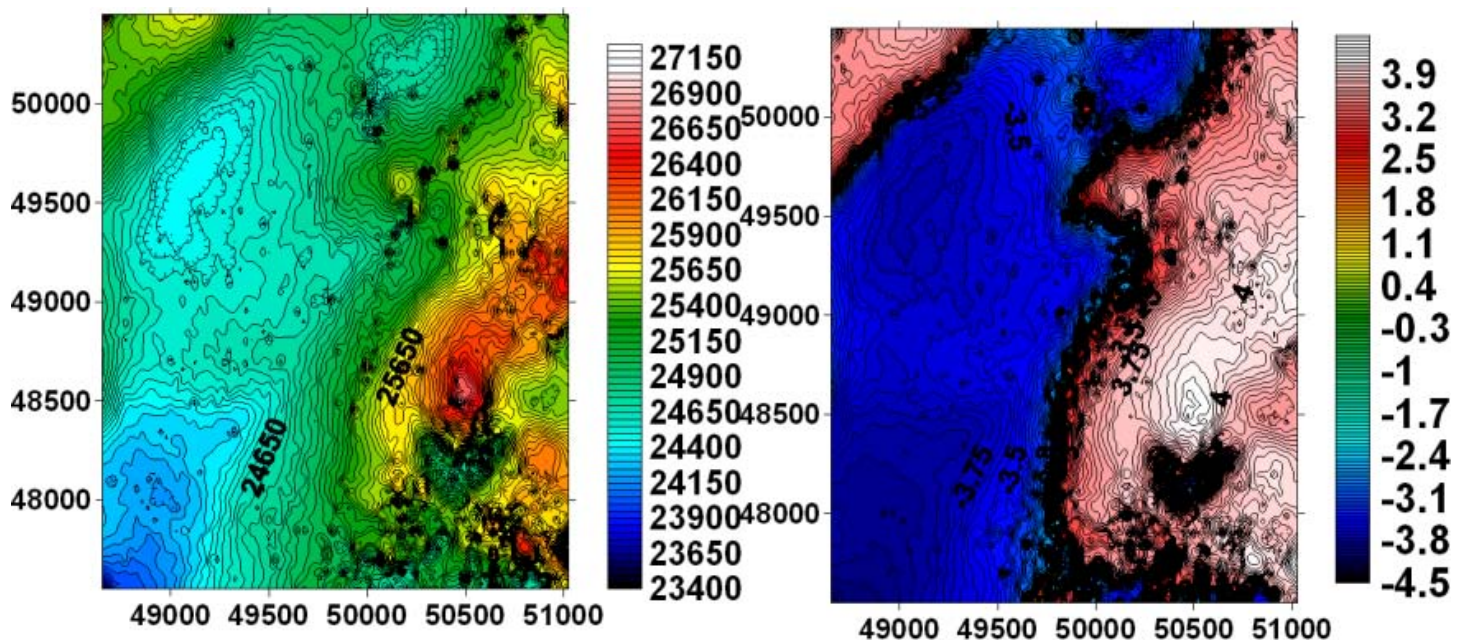


Figure 2. Decorrugated (9x9) TMI (left), LOG10 transformed (right)

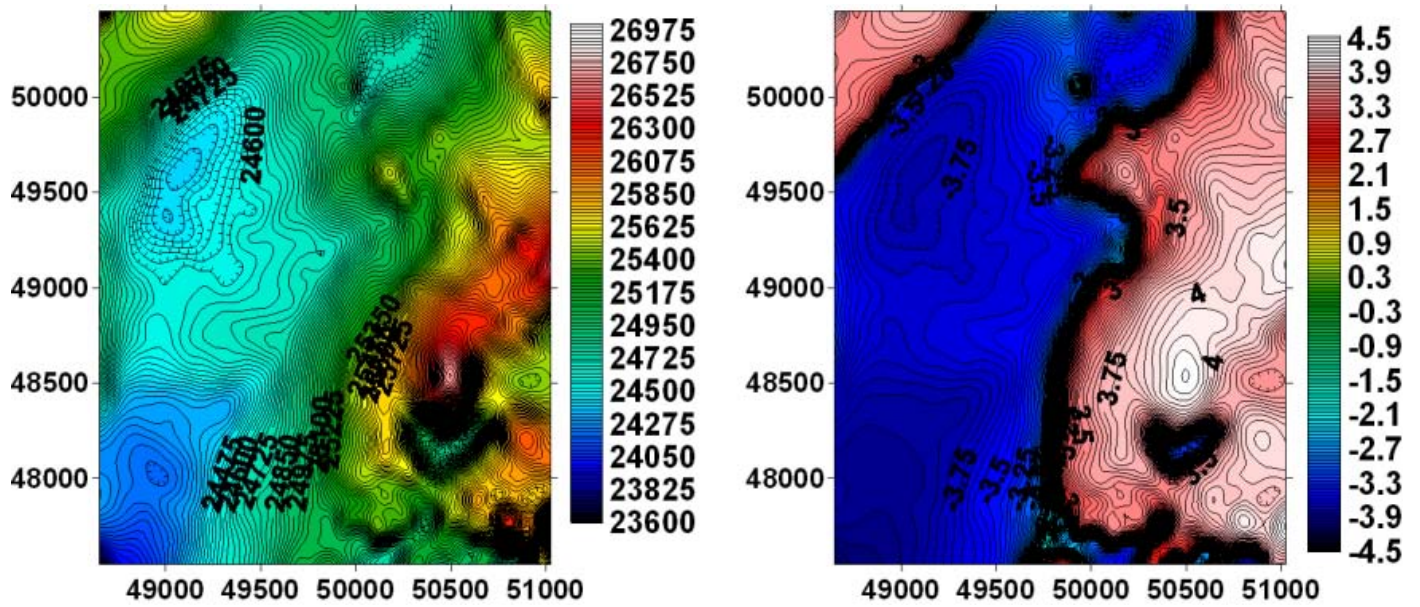


Figure 3. TMI after removal of upper (~20) m dipole layer after decorrugation; LOG10 contours of same on right.

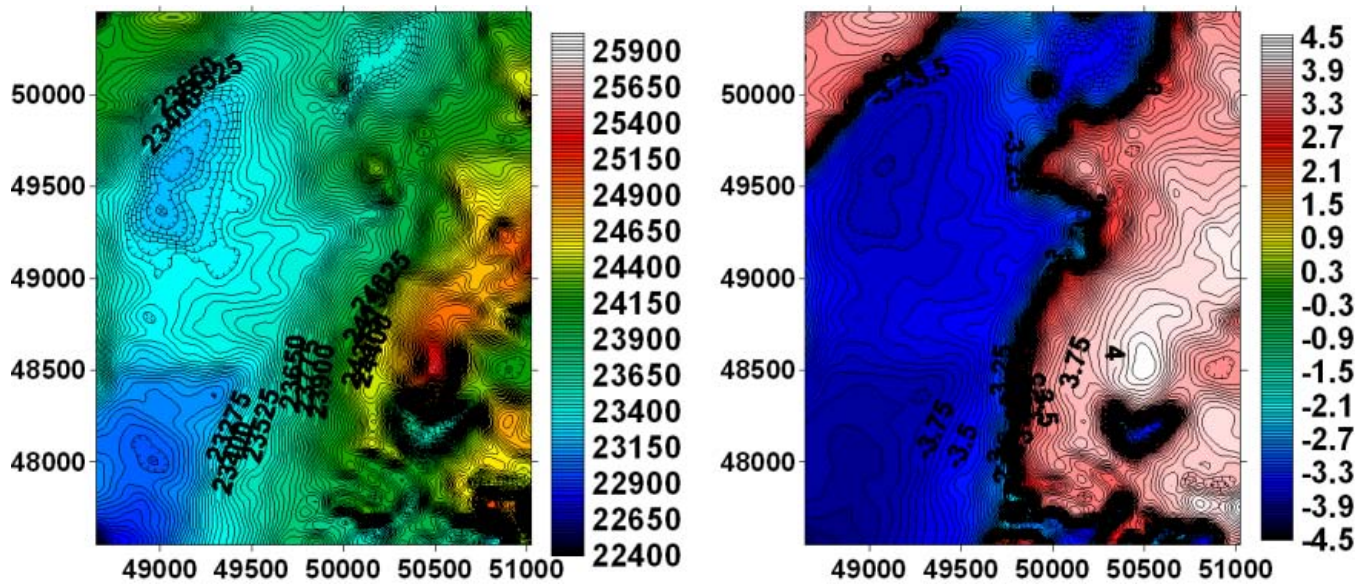


Figure 4. TMI after removal of upper (~20) m dipole layer without decorrugation; LOG10 contours of same on right. As expected, decorrugation had little impact on the lower frequency signal.

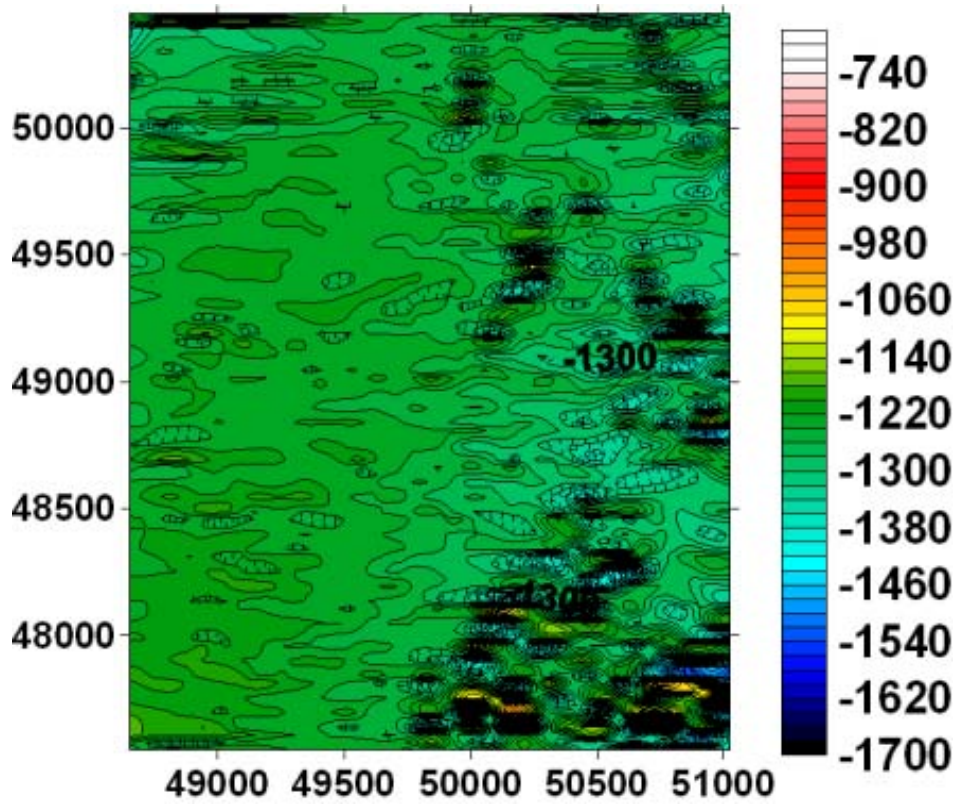


Figure 5. Signal removed with decorrugation using a 9x9 filter.

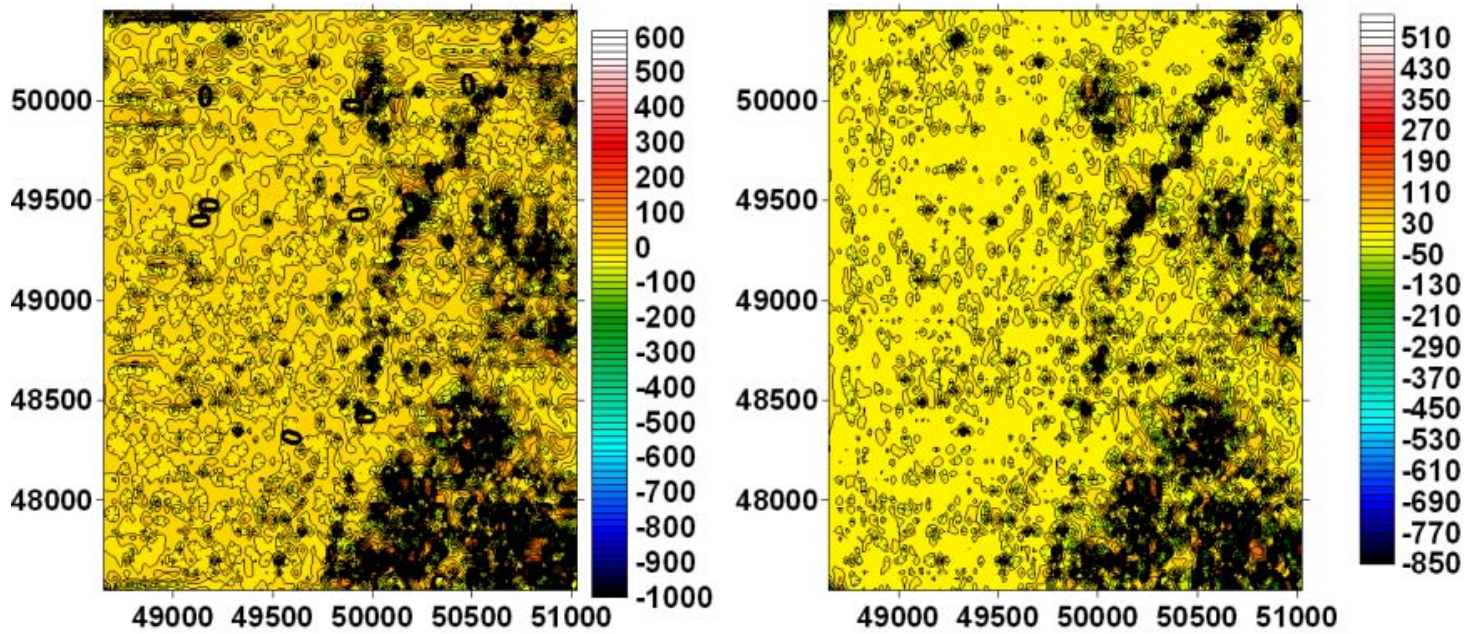


Figure 6. Both images are the shallowest layers separated by matched filtering. The left one is from filtering the original data, the right from matched filtering of the decorrugated data.