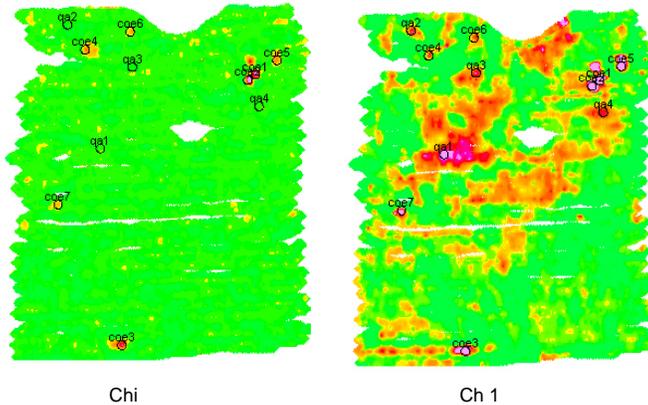




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## Ordnance & Explosives Innovative Technology Program PROJECT: Chi-Squared Study

**PROJECT DESCRIPTION:** This project is testing the ability of chi-squared discrimination analysis to distinguish metallic targets from geologically-induced anomalies in areas of iron-rich soils and rocks.



Comparison of mapped responses of chi-squared analysis with channel 1  
from EM63 geophysical survey data

The strong EM response of magnetic soils is spatially variable in the same wavelength as the response of metal targets. This results in many false targets. Fortunately, the time and/or frequency response of magnetic soil is very consistent, whereas the EM response of most metal targets is distinct across a sufficiently wide band of time or frequency channels. This allows discrimination of metal response using chi-squared analysis.

**POTENTIAL TECHNOLOGY APPLICATIONS:** The chi-squared technology can reduce the number of excavations by eliminating targets that are the result of geology.

**WORK PROGRESS:** Field surveys were completed in coordination with the Waikoloa Removal Action on the island of Hawaii in the Hawaiian Islands during November 2005. Data analysis is in progress.

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