



## **3D Inversion of complex resistivity data: Case study on Mineral Exploration Site.**

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Complex resistivity (CR) method is a frequency domain induced polarization (IP) method. It is also known as Spectral IP (SIP) method, if wider frequencies are used in data acquisition and interpretation. Although it takes more times than conventional time domain IP method, its data quality is more stable because its data acquisition which measures amplitude and phase is done when the source current is being injected. Our research group has been studying the modeling and inversion algorithms of complex resistivity (CR) method since several years ago and recently applied developed algorithms to various real field application. Due to tough terrain in our country, Profile survey and 2D interpretation were generally used. But to get more precise interpretation, three dimensional modeling and inversion algorithm is required. We developed three dimensional inversion algorithm for this purpose. In the inversion, we adopt the method of adaptive lagrangian multiplier which is automatically set based on the size of error misfit and model regularization norm. It was applied on the real data acquired for mineral exploration sites. CR data was acquired with the Zeta system, manufactured by Zonge Co. In the inversion, only the lower frequency data is used considering its quality and developed 3D inversion algorithm was applied to the acquired data set. Its results were compared to those of time domain IP data conducted at the same site. Resistivity image sections of CR and conventional resistivity method were almost identical. Phase anomalies were well matched with chargeability anomalies and the mining history of the test site. Each anomalies were well discriminated in 3D interpretation than those of 2D. From those experiments, we know that CR method was very effective for the mineral exploration.