# Booth No. 5: EXPLORATION GUIDELINES APPLIED TO THE CHUPETE IOA DEPOSIT, LA HIGUERA, COQUIMBO, CHILE

**PICHINUAL BUSTAMANTE, Felipe**, Earth and Biological Sciences, Loma Linda Univesity, 11139 Anderson St., Loma Linda, CA 92350, PIQUER ROMO, Jose, Facultad de Ciencias, Universidad Austral de Chile, Independencia 631, Valdivia, Valdivia 5090000, Chile, MARTINEZ ARDILA, Ana Maria, Department of Earth Sciences and Biological Sciences, Loma Linda University, 11065Campus St., Griggs Hall Rm 116, Loma Linda, CA 92354 and POMPE, Lance, Dept of Earth and Biological Sciences, Loma Linda Univ, Loma Linda, CA 92350

In recent years, as the discovery of new outcropping deposits of high-grade iron has become less feasible, the exploration of deposits at greater depths have caught more interest. The Chupete deposit is a blind deep Iron-Oxide Apatite (IOA) -type deposit in the Coquimbo region, Chile. It is hosted in volcanic rocks of the Punta del Cobre Formation, within the Cretaceous Chilean Iron Belt (CCIB), which may be used as an example deposit for future exploration. The lithology of the Chupete area was determined, consisting mainly of volcanic andesites, with minor interlayered tuffs and andesitic dikes. A NS-trending fault in the central part of the study area controls the emplacement of the magnetite body at depth. Alteration zones are almost symmetrical from the central fault towards the most distal areas. Proximal zones show a potassic alteration (biotite-muscovite-potassium feldspar) overprinting an actinolitic alteration, while the most distal zones are dominated by albite-epidote(-apatite) with the selective replacement of mafic minerals by actinolite. A later silicification event overprints all the previous alterations. Surface mineralization is restricted to the central fault zone, where it occurs as magnetite clasts in fault breccias, minor veins on both volcanic and intrusive rocks and hematite (specularite) associated with silicification. In addition, an alteration index was proposed as a proxy for vectorizing massive magnetite bodies in IOA-type deposits in surface and depth, based on an increase in both an early actinolitic alteration and a later silicification, using Pearce Element Ratios (PER) diagrams. Finally, exploration guidelines were made and a spatial correlation between IOA deposits in the CCIB deposit was suggested, pointing towards possible undiscovered deposits within the belt at depth.