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New HyLogging Technology: Identifying Mineralogy in Seafloor Drill Core

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HyLoggerTM is a new core logging technology developed by CSIRO Exploration and Mining that facilitates the rapid collection of high density spectral reflectance measurements, synchronized with continuous high resolution digital colour imagery, to provide objective assistance in geological logging and identifying mineralogy in drill core. Previously used in a number of land-based exploration and mine-scale environments, the recent first ever commercial drilling of a seafloor massive sulfide hydrothermal system within the Kermadec volcanic arc, New Zealand, provided an opportunity to apply the technology to seafloor drill core collected from a unique marine environment. The robotically controlled HyLogging procedure, coupled with the semi-automated interpretation software, enables the identification of a suite of minerals (e.g. phyllosilicates, amphiboles, carbonates, sulphates and iron oxides) by their diagnostic spectral absorption features displayed in the visible-to-near-infrared (450-1000 nm) and shortwave-infrared (1000-2500 nm) regions of the electromagnetic spectrum. Preliminary results indicate potential of this technique to map mineralogy and therefore physio-chemical environments associated with seafloor sulfide chimney structures.