Electromagnetic Shear and Flexural Attenuation Combination to Overcome Cement Evaluation Challenges in Modern Wells, by Chee Kong Chen, Senior Cased Hole Data Analyst at Baker Hughes

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Abstract: Cement integrity is very important in oil and gas industry and recently light weight cement slurries have been extensively used in modern wells due to multiple challenges. Evaluating such slurries has been always a challenge due to its very low acoustic impedance and the narrow dynamic range of compressional attenuation-based tools. Electro Magnetic Acoustic Transducers (EMATs) are utilized to generate and measure acoustic guided waves directly on the casing. EMATs consists of an arrangement of coils, magnets, and conductive casing. The acoustic waves are generated by driving current through the coil, which creates eddy currents in the casing. Having this sensors setup allows for generation of shear and flexural waves directly on the casing and minimizes corrections required for borehole fluid. The measurements of shear waves attenuation allow higher confident to differentiate between lightweight, while the flexural waves attenuation measurement allows micro-annulus detection without the need for additional pressure passes. The presentation will discuss the measurements and case studies of shear / flexural combination to overcome light weight cement evaluation challenge as well as liquid micro-annulus challenges with no need of additional pressure pass.