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## **Imaging Improvement of Fractured and Faulted Basement through Controlled Beam Migration Examples from Diamond Field in Vietnam**

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### **Abstract**

The accurate determination of the velocity distribution in the subsurface is the single most important part in the long sequence of processing steps. Those accurate tomographic velocity models demand a state-of-the-art migration algorithms to honor the details that are needed in imaging the relevant complex structures. Controlled Beam Migration (CBM) is one of those techniques that exhibit an excellent impact on imaging Fractured and Faulted Granite basement. The velocity model that is used for depth imaging generally undergoes various iterations. It is the most difficult process, but yet also is the most important part of the velocity puzzle. Cell Based Tomography technique based on residual curvature analysis (RCA) was used for sediments velocity model building above the basement. In order to overcome the limitation of RCA tomography as it becomes less sensitive to velocity perturbation at deeper depth, Stack Sweep method has been performed to update the velocities inside the basement reservoir. This paper will concentrate mainly on the uplift of data imaging starting with Kirchhoff Pre Stack Time Migration passing through Kirchhoff Pre Stack Depth Migration and ending with Controlled Beam migration. CBM has a combined advantage of Kirchhoff migration (steep dip imaging) and Wave Equation Migration (multi-arrivals). It handles multi-arrivals, resulting in a cleaner image than Kirchhoff migration, and preserves the steep dips. Examples of the techniques are shown on data from Diamond Field, Offshore Vietnam with a discussion of specific issues that were encountered during processing.