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3D Volume Rendering Technique Reveals a Possible New Impact Structure within the Orange Basin, Offshore South Africa

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We have interpreted a high resolution 3D reflection seismic data from the exploration Block 2A of the Orange Basin, offshore South Africa, using the 3D volume rendering technique, and have discovered a crater of approximately 5-7 km in size that is indicative of a possible impact structure preserved within the post-rift Cretaceous sediments. The comparison of this crater with other circular structures, such as pockmarks and mud volcanoes that occur within the exploration Block 2A of the Orange Basin, revealed lack of gas escape features below it, which supports an impact origin for the crater. The crater exhibits morphological characteristics similar to complex impact craters and transected by an approximately 400 m wide gully that probably developed as a result of resurge of water back into the crater after the impact. The association of the crater with sub-marine alluvial delta fans suggests the impact probably occurred in a shallow marine deltaic environment, where rapid sediment input was responsible for its rapid burial and eventual preservation. The crater is of Cretaceous age, based on its preservation within the post-rift Cretaceous sediments.

Key words: 3D seismic, impact crater, seismic interpretation, volume rendering.