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STRUCTURE OF THE CHICXULUB CRATER: WHERE DO WE STAND?

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Away from the crater center, marine seismic reflection data reveal bright reflective packages that, on the basis of onshore drill holes, have been interpreted as Mesozoic sediments. Towards the center of the crater these reflectors become increasingly disrupted, are faulted and folded, and disappear at radii < 40 km. Inside this radius the Mesozoic rocks have been excavated during impact. Using these data, the excavation and transient cavities are constrained to lie between 80- and 110-km diameter. The uncertainty lies with the reconstruction of the transient cavity. A more precise figure may be obtained when we have a better understanding of the dynamics of crater collapse. Offsets in the Mesozoic sediments that can be tracked around the crater suggest that Chicxulub has a multi-ring basin morphology.

At the center of the crater, 3D seismic refraction velocity data reveal high-velocity material a few kilometers below surface. Its location coincides in position with a gravity high, previously interpreted as representing rocks that have been uplifted during crater collapse. Interestingly, the stratigraphic uplift has a concave upward top, and resolution tests show that this is a genuine feature. The concave shape suggests the uplift involves both vertical and outward flow in the central region during crater collapse, and is consistent with models generated using hydrocodes.

Physical property measurements on cores from the onshore CSDP hole will be used, along with forth-coming high-resolution seismic data to be shot across the central crater, to refine 3D structural and lithological models of the crater. Proposed IODP drilling through the topographic peak ring will test mechanisms for peak ring forma-

tion, and sample impact breccias and melt rocks close to the crater center. Proposed IODP drilling outside the crater through a complete section of Mesozoic rocks will be used to characterize the rocks involved in impact and constrain the environmental consequences of this impact.