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Impact micro-craters in a steel tube located in the area devastated by the 1982 eruption of El Chichón volcano: a clue for a better understanding its past events.

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The March 29-April 4, 1982 eruption of El Chichón volcano has been considered one of the most violent eruption in the world in the twentieth century. In Mexico it represents the worst disaster caused by volcanic activity occurred in historic times. The most violent eruptive episodes occurred on April 4, producing pyroclastic falls, flows, and surges that buried nine villages around the volcano and killed more than 2,000 people. A steel, square-section baskeball post is the only object that crops out 148 cm off the ground in the village of Esquipula Guayabal, 3.5 km SE of the crater. A close observation of its external surfaces revealed the presence of sub-millimeter to sub-centimeter craters of different depths, which are more abundant on the surface facing the volcano. They were apparently caused by lateral impacts of ash against the metal, as evidenced by the presence of hundreds of micron size crystals visible in some cases inside the steel surface. The stratigraphy observed in a dig (200 cm long, 70 cm wide and 170 cm deep) made around the baskeball post reveals, beside the presence of two fallout layers, at least four pyroclastic surge flow units consisting of coarse pumice lapilli and blocks (up to 30 cm) and sparse accidental-lithic blocks (up to 25 cm) immersed in a matrix of coarse-medium ash; blocks of concrete (46 x 38 cm max.) and other debris of the village houses are also present.

Microscopic investigations of several transversal sections of the post reveal that structural deformations of the steel occur at different levels and depths below the impact craters. These preliminary data can be used to obtain a range of velocities for the im-

pacting material. The relatively low-density distribution of the craters on the surface of the post, their small dimensions compared to the mean grain size observed in the deposits, as well as the structural modifications observed in the steel, all suggest that they were produced by a very energetic phenomenon other than a pyroclastic density current.