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Floor Fractured Craters around Syrtis Major, Mars

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Craters around Syrtis Major are eroded and/or refilled. Syrtis Major is one of the large Hesperian-aged volcanic regions on Mars. Basaltic deposits originating from nearby Syrtis Major cover the floor of impact craters. In particular some craters exhibit a fractured floor.

Floor Fractured Craters can be divided in types. The grade of erosion and the geologic process, which formed the crater, can be different.
Type 1: Crater floor affected by pit chains or narrow crevices which are sometimes discontinuous. Type 2: More developed and dense networks of crevices as type 1. Crevices are wide and deep enough to be detected. A circular moat starts to develop as crevices concentrate along the rim. Type 3: Mainly distinguished from type 2 by the presence of a fully developed circular moat. The flat central part is divided into several blocks by crevices. Type 4: They show also a continuous moat along the rim but the central part consists of many flat-top blocks and small conical mounds. Type 5: Crater floor has many mounds of irregular sizes, but the flattop blocks are absent. It should be noted that the knobby surface shows typical characteristics of chaotic terrains and could be alternatively classified as such. Type 6: Crater without a circular moat, crevices are not fully developed, flat-top blocks are present. Fractured floor could have been reshaped through geologic processes.

Floor fractured craters can be found in three different areas. The first area is located in the south-eastern part of Syrtis Major, bordering to the highlands. Volcanic features like lava flow fronts, lava flows and wrinkle ridges dominate this region. The crater floor is separated in sharp-edged plates and the interior seems to be flooded by basaltic material. The second area is in the north of Syrtis Major and transcend to the chaotic terrain further north. Near the martian dichotomy boundary fluvial activity was the decisive process. The crater rims are highly eroded, channels are cutting through the crater rim and the crater floor is dissected and separated in several plates with smoothed and rounded shape. In the north-west of Syrtis Major fluvial and volcanic features can be detected.

The appearance of the craters depends on the erosion processes, which differs between the three areas. Floor fractured craters develope in volcanic or water-rich areas. Furthermore the 6 crater types are not sufficient to classify all floor fractured craters around Syrtis Major. New types have to be defined, especially for craters in volcanic areas.