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A Swarm of Small Shield Volcanoes on Syria Planum, Mars, analysed using Mars Express - HRSC data

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Tharsis province shows a complex volcanic history in relation to its number, type and variety of volcano-tectonic features. We focus our study on Syria Planum, at the centre of Tharsis bulge at 8 km of altitude. We used stereo high resolution images from HRSC (High Resolution Stereo Camera- Mars Express mission) instrument, orbits 2032, 2054 and 2021, with 15 m/pixel resolution, and overlaid on altimetry MOLA (Mars Orbital Laser Altimeter – Mars Global Surveyor mission) data, with 128 pixel/degree resolution, to construct a local crossover-corrected topography grid. New HRSC data allow us to observe plain style volcanic systems revealed by the presence of many shallow volcanic edifices, of typically 10-20 km diameter and 100-200 m high. On the same context, we observe oriented flow patterns, fractures showing several sizes and directions, summit craters, isolated vents and volcanic eruptions along tube and vent-fed flows. The low slopes of volcanoes with less than 2˚ and their geomorphic characteristics show they likely corresponds to shallow shield volcanoes composed of fluid basaltic lavas. Syria Planum contains a swarm of more than 30 edifices that are peripheral to large volcanic shields (the Montes), and surrounded by fractures and collapse features suggesting atypical tectono-magmatic conditions.