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An Overview of the SuperCam Instrument Suite in Jezero Crater, Mars

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NASA's *Perseverance* rover landed in Jezero crater, Mars, in February of 2021. In the 350+ martian solar days (sols) since, the rover has explored 3.5+ km of the crater floor, which is thought to contain the remnants of a paleo lake [1]. SuperCam, an instrument onboard *Perseverance*, uses multi-techniques to investigate the texture, mineralogy, and chemistry of the surface. Its capabilities include high-resolution imagery using the Remote Micro Imager (RMI), visible to near-infrared spectroscopy (VISIR), remote time-resolved green-laser Raman and fluorescence spectroscopy, Laser Induced Breakdown Spectroscopy (LIBS), and acoustic sensing [2, 3].

As *Perseverance* explores Jezero crater and its delta, SuperCam observations will broaden our understanding of Mars's rich history of volcanic activity, aqueous weathering, and hydrothermal alteration, and may even bring us closer to finding signs of past habitability. The rover touched down two km from Jezero crater's delta front in the Máaz formation [1]. Initial SuperCam measurements identified basaltic mineralogy and imaged igneous textures [4]. *Perseverance* traversed along Artuby Ridge from sol 177 to 201, detecting a clear change in the bedrock chemistry with higher amounts of Ca and Ti [5]. The rover then entered the Séitah formation, where olivine signatures, Fe-Mg pyroxene, and carbonates were detected [6]. Since the olivine chemistry is out of equilibrium with the bulk material, it is interpreted to be an igneous cumulate [5].

All materials analyzed thus far are igneous with signs of aqueous alteration. Orbital data has detected serpentine, an aqueous weathering product of olivine and pyroxene, in Jezero crater [7]. We are conducting laboratory Raman, LIBS and VISIR measurements on serpentine samples to interpret results of SuperCam. In this talk, mission and laboratory results will be presented and discussed.

References:

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