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Physical Sedimentology and Stratigraphy of the lower Western Fan (Shenandoah formation) Jezero Crater, Mars:

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Title (250 characters):

Physical Sedimentology and Stratigraphy of the lower Western Fan (Shenandoah formation) Jezero Crater, Mars: Results from the Mars 2020 "Delta Front" Campaign

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Abstract (250 words):

The *Perseverance* rover is exploring a sedimentary deposit within the Late Noachian-aged (4.0-4.8 Ga) Jezero Crater interpreted to be the remnants of a delta. From April 2022 through February 2023, *Perseverance* investigated the basal 25 m of sediments exposed in the fan's eastern scarp. Rover instruments collected a suite of imaging, geochemical, mineralogical, and ground-penetrating radar data.

Perseverance made detailed observations through two sections of the lower fan ~600 m apart. Similar facies and stratigraphic trends are present in both sections. Each section contains two coarsening-up successions. While some finer-grained units are laterally continuous between the two sections, the coarser-grained bodies that cap each section are laterally discontinuous and do not extend between sections.

Both sequences are 10 - 15 m thick. Their lower strata are dominated by sulfate-cemented, planar laminated, very fine- to medium-grained sandstone and siltstone with rare low-angle truncations. Soft-sediment deformation occurs in the form of decimeter-scale lateral folds. Laminae are normally graded. These sequences are capped by meter-scale thick sheets of coarse-grained sandstone, pebbly sandstones, and conglomerates that are variably low-angle cross-bedded, trough cross-bedded, and planar-stratified. Plane beds are massive or normally graded.

Two hypotheses for the depositional environment have emerged for this succession: a sub-aerial setting with extensive "overbank" facies and shallow braided channels and a proximal pro-deltaic setting with deposition driven by hyperpycnal flows. These hypotheses will be tested against observations made by *Perseverance* as it traverses the "Fan Top" and by more comprehensive studies of the "Delta Front" data.