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Lander Radioscience (LaRa) in ExoMars 2020 to obtain the rotation and orientation of Mars.

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The Lander Radioscience (LaRa) experiment on the ESA-Roscosmos ExoMars 2020 mission is designed to obtain coherent two-way Doppler measurements from the radio link between a lander on Mars and the Earth over at least one Martian year. The Doppler measurements will be used to determine the orientation and rotation of Mars in space (precession, nutations, and length-of-day variations). LaRa, on another location on the Martian surface with respect to the InSight mission could allow to observe the polar motion of Mars, in addition to further increase the accuracy on precession, nutation, and length-of-day measurements. The ultimate objective of LaRa is to obtain information on the Martian interior and about the sublimation/condensation cycle of atmospheric CO_2. Concerning the nutations, a knowledge of the rigid body nutation can be computed and shall be used to constrain the interior properties of Mars.