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A Mars Year of Forbush Decreases on the Martian Surface

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We report on measurements of more than 100 Forbush decreases on the surface of Mars over nearly one complete Martian year (the equivalent of 1.88 Earth years). For our study we use observations from the Mars Science Laboratorys Radiation Assessment Detector (RAD) over the time period from shortly after landing in August 2012 to mid-2014. We characterize the observed Forbush decreases with respect to frequency, magnitude, and duration. For a subset, we identify individual drivers of the Forbush decreases on Mars, i.e. recurrent and transient structures in the inner heliosphere. To do so we utilize the data-driven WSA-ENLIL model and observations provided by SOHO and from the two STEREO spacecraft at various solar longitudes near 1 AU. As separation distances of Mars from spacecraft locations vary with time, solar longitude, latitude, and distance from the Sun, we focus on specific alignment periods for more detailed analyses. Additional Co-authors include the MSL RAD Science Team and members of the NASA/GSFC CCMC: L. Berger, N. Dresing, C. Drews, J. Guo, K. Herbst, P. Kuehl, P. MacNeice, J. P. Andrews, R. Beaujean, S. Boettcher, D. E. Brinza, M. A. Bullock, S. Burmeister, F. A. Cucinotta, B. Ehresmann, M. Epperly, D. Grinspoon, D. M. Hassler, M.-H. Kim, J. Koehler, O. Kortmann, C. Martin-Garcia, R. Mueller-Mellin, K. Neal, S. C. R. Rafkin, G. Reitz, L. Seimetz, K. D. Smith, Y. Tyler, and E. Weigle.