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Injection and acceleration at interplanetary traveling shocks, planetary bow shocks, and the heliospheric termination shock

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The correspondence between the occurrence of collisionless shocks and energetic particles in the solar system is nearly one-to-one: gradual solar energetic particle events are observed during the passage of large CME driven shock waves, the dominant population of interplanetary energetic particles is associated with corotating interaction regions, energetic diffuse ions are observed in front of planetary bow shocks, and the anomalous component of the cosmic rays is due to acceleration of interstellar pickup ions at the heliospheric termination shock. In recent years the observations of abundance variations and fractionation processes have added considerable details, and present a major challenge for the theory of injection and acceleration at the various shocks. After reviewing the basic observations of energetic particles observed near the various interplanetary shocks we will in particular address the question of whether quasi-perpendicular or quasi-parallel shocks are more effective accelerators in the Corona, whether the solar wind population or a supra-thermal particle population is more likely to be accelerated at interplanetary traveling shocks, and how pickup ions are possibly injected into an acceleration process at the heliospheric termination shock.