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The role of the recovery process in the medium and long-term modulation of cosmic rays

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Abstract. In a phenomenological approach cosmic ray modulation can be essentially de-scribed as an interplay between decreases and subsequent recoveries. Whereas the decreases are to a large part diffusion dominated and can be related to increases of the interplanetary magnetic field magnitude, the recovery process is strongly in uenced by drift effects. This can be seen by a difference in the behavior of electrons and protons during the same polarity epoch as well as by different recovery times of high energy protons between odd and even so-lar cycles. The overall situation is rather complex because superimposed on a more gradual variation of the interplanetary transport parameters are medium term decreases of the order of one year duration. The stochastic nature of the medium-term decreases leads to part of the differences from one 11year-cycle to the next. A comparison of solar cycles 21 and 22 indicates the importance of recovery effects for systematic differences between the two cycles.