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Record Dynamics and the Parking Lot Model for granular dynamics[1] PAOLO SIBANI, University of Southern Denmark, STEFAN BOETTCHER, Emory University — Also known for its application to granular compaction (E. Ben-Naim et al., Physica D, 1998), the Parking Lot Model (PLM) describes the random parking of identical cars in a strip with no marked bays. In the thermally activated version considered, cars can be removed at an energy cost and, in thermal equilibrium, their average density increases as temperature decreases. However, equilibration at high density becomes exceedingly slow and the system enters an aging regime induced by a kinematic constraint, the fact that parked cars may not overlap. As parking an extra car reduces the available free space,the next parking event is even harder to achieve. Records in the number of parked cars mark the salient features of the dynamics and are shown to be well described by the log-Poisson statistics known from other glassy systems with record dynamics. Clusters of cars whose positions must be rearranged to make the next insertion possible have a length scale which grows logarithmically with age, while their life-time grows exponentially with size. The implications for a recent cluster model of colloidal dynamics,(S. Boettcher and P. Sibani, J. Phys.: Cond. Matter, 2011 N. Becker et al., J. Phys.: Cond. Matter, 2014) are discussed.

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