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Results are provided that highlight the effect of interfacial discontinuities in the diffusion coefficient on the behavior of local times and occupation times. The main goal is to obtain a characterization of large scale parameters by an analysis at the fine scale of stochastic particle motions. In particular it is shown that the continuity of a natural modification of local time is the individual (stochastic) particle scale equivalent to continuity of flux at the scale of the (macroscopic) particle concentrations. Interfacial effects on occupation time of the associated stochastic particles are obtained as a consequence. This is based on published work in collaboration with T. Appuhamillage, V. Bokil, E. Thomann, and B. Wood at Oregon State University in the case of piecewise constant coefficients, and work in preparation with Jorge Ramirez, Nacional University of Colombia, and Enrique Thomann for the case of piecewise smooth coefficients. (Received August 04, 2014)