The collision spectrum of Λ -coalescents

 Λ -coalescents model the evolution of a coalescing system in which any number of blocks randomly sampled from the whole may merge into a larger block. For the coalescent restricted to initially n singletons we study the collision spectrum $(X_{n,k}: 2 \leq k \leq n)$, where $X_{n,k}$ counts, throughout the history of the process, the number of collisions involving exactly k blocks. Our focus is on the large n asymptotics of the joint distribution of the $X_{n,k}$'s, as well as on functional limits for the bulk of the spectrum for simple coalescents. Similarly to the previous studies of the total number of collisions, the asymptotics of the collision spectrum largely depends on the behaviour of the measure Λ in the vicinity of 0. In particular, for beta(a, b)-coalescents different types of limiting distributions occur depending on whether $0 < a \leq 1, 1 < a < 2, a = 2$ or a > 2. For a > 2 the limiting distribution is unknown except for a = 3, in which case the block counting process and its Siegmund dual fixation line have constant hitting probabilities leading to a full description of the asymptotics of the collision spectrum. (joint work with Alexander Gnedin, Alexander Iksanov and Alexander Marynych)