A specific N-particle system of Fleming-Viot Type: Recurrence-transience properties

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We introduce a particle process of N individuals which perform Brownian motion in one or more dimensions up to an exponential time with rate λN. At this time the particle with the minimal fitness jumps on an uniformly chosen remaining particle, where fitness is measured by the function $s(x) = 1/||x||$. We can prove that the localisation of the jumps strongly counteracts the transient behaviour of the Brownian motion in the sense that the process is (neighbourhood-)positive-recurrent for all choices of parameters.