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Sedimentation and gravitational instability of Escherichia coli Suspension DOMINIQUE SALIN[1], UPMC, CARINE DOUARCHE, University Paris Saclay — The successive runs and tumbles of Escherichia coli bacteria provide an active matter suspension of rod-like particles with a large swimming, Brownian like, diffusion. As opposed to inactive elongated particles, this diffusion prevents clustering of the particles and hence instability in the gravity field. We measure the time dependent *E. coli* concentration profile during their sedimentation. After some hours, due to the dioxygen consumption, a motile / non-motile front forms leading to a Rayleigh-Taylor type gravitational instability. Analysing both sedimentation and instability in the framework of active particle suspensions, we can measure the relevant bacteria hydrodynamic characteristics such as its single particle sedimentation velocity and its hindrance volume. Comparing these quantities to the ones of equivalent passive particles (ellipsoid, rod) we tentatively infer the effective shape and size of the bacteria involved in its buoyancy induced advection and diffusion.

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