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**Diffusion of passive particles in active suspensions** MATTHIAS MUSSLER, Saarland University, SALIMA RAFAI, UJF Grenoble, Liphy, THOMAS JOHN, Saarland University, PHILIPPE PEYLA, UJF Grenoble, Liphy, CHRISTIAN WAGNER, Saarland University — We study how an active suspension consisting of a definite volume fraction of the microswimmer *Chlamydomonas Reinhardtii* modifies the Brownian movement of small to medium size microspheres. We present measurements and simulations of trajectories of microspheres with a diameter of 20 $\mu$m in suspensions of *Chlamydomonas Reinhardtii*, a so called "puller," and show that the mean squared displacement of such trajectories consist of parabolic and a linear part. The linear part is due to the hydrodynamic noise of the microswimmers while the parabolic part is a consequence of directed motion events that occur randomly, when a microsphere is transported by a microswimmer on a timescale that is in higher order of magnitude than the Brownian like hydrodynamic interaction. In addition, we theoretically describe this effect with a dimensional analysis that takes the force dipole model used to describe "puller" like *Chlamydomonas Reinhardtii* into account.

Matthias Mußler
Saarland University

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