

## **Boundary conditions for active Brownian particles**

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We consider the transport of active particles inside a channel domain. These are treated using the Active Brownian Particle model (ABP), where particles move forward at constant speed but in a randomly-varying direction. We examine their accumulation near the boundary as the singular limit of a better-behaved model that includes small spatial diffusion. We present matched asymptotic approximations that describe their reduced dynamics at long times. In the reduced dynamics, the probability density for the particle position has a singular component localised on the boundary which is coupled in two-way fashion to the smooth interior component. The results are illustrated by a number of numerical simulations. This is joint work Daniel Loghin (University of Birmingham) and Jacques Vanneste (University of Edinburgh).