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The swim force as a body force WEN YAN, Department of Mechanical & Civil Engineering, California Institute of Technology, JOHN BRADY, Division of Chemistry & Chemical Engineering and Engineering & Applied Science, California Institute of Technology — Net (as opposed to random) motion of active matter results from an average swim (or propulsive) force. It is shown that the average swim force acts like a body force – an *internal* body force [Yan and Brady, *Soft Matter*, DOI:10.1039/C5SM01318F]. As a result, the particle-pressure exerted on a container wall is the sum of the swim pressure [Takatori *et al., Phys. Rev. Lett.*, 2014, **113**, 028103] and the 'weight' of the active particles. A continuum mechanical description is possible when variations occur on scales larger than the run length of the active particles and gives a Boltzmann-like distribution from a balance of the swim force and the swim pressure. Active particles may also display 'action at a distance' and accumulate adjacent to (or be depleted from) a boundary without any external forces. In the momentum balance for the suspension – the mixture of active particles plus fluid – only *external* body forces appear.

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