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Title: Second order lubrication squeezing flow field between a spherical particle and a plane wall.

Abstract: The lubrication squeezing flow field between a spherical particle and a plane wall is obtained by solving the Stokes flow problem in terms of a second order expansion for small gaps. The result is in excellent agreement with the solution of Stokes equations obtained as series in bispherical coordinates by Brenner (1961) and Maude (1961) for the fluid velocity and Pasol et al (2005) for the pressure. The second order approximation of the pressure is systematically larger than the classical one obtained from first order lubrication. This result may thus have important practical implication whenever material resistance is concerned.