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A single dumbbell falling under gravity in a cellular flow field

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Corrigendum

A single dumbbell falling under gravity in a cellular flow field

M F Piva and S Gabbanelli 2003 *J. Phys. A: Math. Gen.* **36** 4291–4306

We noted that there was a mistake concerning the stability of the fixed points where the molecule is located horizontally. For $B \to 0$, the points $P_1 = (\cos^{-1} V_g, \pi/2)$, $P_2 = (\pi - \cos^{-1} V_g, 3\pi/2)$ are stable but $P_3 = (0, \sin^{-1} V_g)$ is unstable. The corrected values and its evolution with B are presented in figures 1 and 2 of this corrigendum and they replace figures 9 and 10 of the above article.

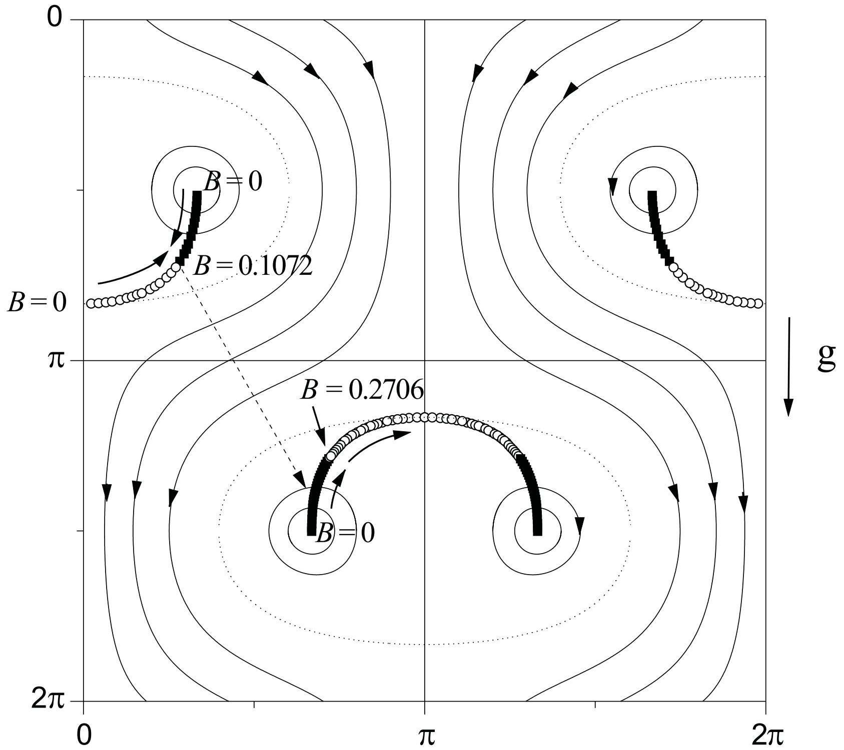

Figure 1. Evolution with B of the fixed point defined by $x_2 = 2\pi - x_1$, $y_1 = y_2$; $0 < x_1 < \pi$, $0 < y_1 < 2\pi$. Superposed streamlines correspond to the velocity field for a sedimenting single particle in the cellular flow field: ■ stable fixed points, ○ unstable fixed points. The collapse between the two fixed points on the upper branch occurs at $B = 0.1072$. Transition from stable to unstable fixed point in the lower branch occurs at $B = 0.2706$.

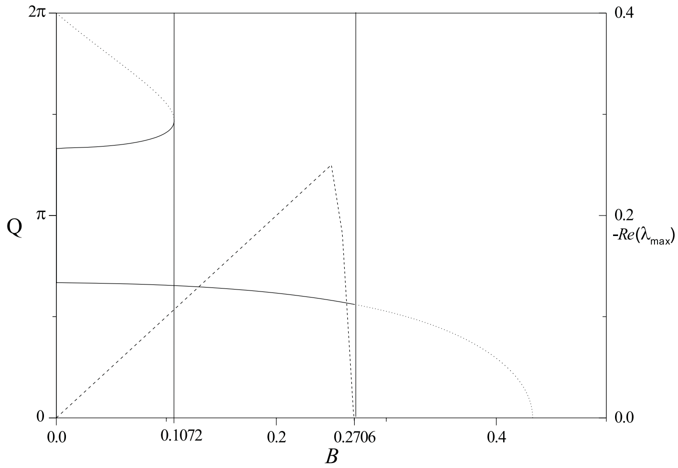

Figure 2. Evolution of the fixed point defined by $x_2 = 2\pi - x_1$, $y_1 = y_2$; $0 < x_1 < \pi$, $0 < y_1 < 2\pi$. Left axis: dumbbell length as a function of B: ——, stable fixed points, $\cdots\cdots$ unstable fixed points. Right axis: - - - - maximum real part of the eigenvalues, $\mathrm{Re}(\lambda_{\max})$.