Rates of convergence to equilibrium for collisionless kinetic equations in slab geometry

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This work deals with free transport equations with partly diffuse stochastic boundary operators in slab geometry. Such equations are governed by stochastic semigroups in L^1 spaces. We prove convergence to equilibrium at the rate $O\left(t^{-\frac{k}{2(k+1)+1}}\right)$ $(t \to +\infty)$ for L^1 initial data g in a suitable subspace of the domain of the generator T where $k \in \mathbb{N}$ depends on the properties of the boundary operators near the tangential velocities to the slab. This result is derived from a quantified version of Ingham's tauberian theorem by showing that $F_g(s) := \lim_{\varepsilon \to 0_+} (is + \varepsilon - T)^{-1} g$ exists as a C^k function on $\mathbb{R} \setminus \{0\}$ such that $\left\| \frac{d^j}{ds^j} F_g(s) \right\| \leq \frac{C}{|s|^{2(j+1)}}$ near $s = 0$ and bounded as $|s| \to \infty \quad (0 \leq j \leq k)$.

REFERENCE

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