

**Cercignani, Carlo; Lampis, Maria; Lorenzani, Silvia**

**Variational approach to plane Poiseuille flow with general boundary conditions.** (English)

Zbl 1182.76945

Ketsdever, Andrew D. (ed.) et al., Rarefied gas dynamics. 23rd international symposium, Whistler, British Columbia, Canada, July 20–25, 2002. With CD-ROM. Melville, NY: AIP, American Institute of Physics (ISBN 0-7354-0124-1/hbk). AIP Conf. Proc. 663, 141-148 (2003).

Summary: We consider the plane Poiseuille problem in the transition regime, in order to calculate the flow rate versus an inverse Knudsen number in the case of different boundary conditions for the Boltzmann equation. The adopted technique is a variational one [the first author, The Boltzmann equation and its applications. Applied Mathematical Sciences, Vol. 67. New York etc.: Springer-Verlag. XII (1988; Zbl 0646.76001); Rarefied gas dynamics. From basic concepts to actual calculations. Cambridge Texts in Applied Mathematics. Cambridge: Cambridge University Press. xviii (2000; Zbl 0961.76002); J. Stat. Phys. 1, No. 2, 297–311 (1969)], which applies directly to the integrodifferential form of the Boltzmann equation and allows to take into account general models of boundary conditions for the Boltzmann equation, formulated in the frame of the scattering kernel theory.

For the entire collection see [Zbl 1014.00031].

**MSC:**

**76P05** Rarefied gas flows, Boltzmann equation in fluid mechanics

**76M30** Variational methods applied to problems in fluid mechanics

Cited in **3** Documents