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Flow of a rarefied gas in a micro channel caused by oscillatory heating of a wall TOSHIYUKI DOI, Tottori University — A rarefied gas in a micro channel where one of the channel wall is heated periodically in time is studied numerically on the basis of the linearized Boltzmann equation for a hard sphere molecular gas. The time-dependent motion of the gas caused by the heating is investigated with the aid of a deterministic numerical method for a wide range of the Knudsen number (=mean free path/channel with D) and the Strouhal number (=frequency $\times D$ /sound speed). The gas motion is highly induced by the heating when Sh $= 3 \sim 4$, for $0.1 \leq$ Kn ≤ 10, so the normal stresses of the gas acting on the walls are. At about Sh$= 1.5 \sim 2$, the normal stress acting on the heated wall exhibits a rather sharp minimum with respect to Sh, while no such sharp minimum is found in that on the other wall.

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