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**$\lambda$ -DNA thermal migration in a microchannel** JENNIFER KREFT, Institute of Physics, Academia Sinica, Taipei, Taiwan, YENG-LONG CHEN, Institute of Physics and Research Center for Applied Science, Academia Sinica, Taipei, Taiwan — The Ludwig-Soret effect, the migration of a species due to a temperature gradient, has been extensively studied without a complete picture of its cause. Many particle and polymer solutions have been used to study the phenomena; here we investigate the dynamics of DNA confined to a microchannel and subjected to a thermal gradient using a combination of Brownian dynamics and the lattice Boltzmann method. We observe that the DNA molecules will migrate to colder regions of the channel, an observation also made in the experiments of Duhr, et al (Eur. Phys. J. E, **15**, (2004)). In fact, the thermal diffusion coefficient found for a range of temperature gradients and DNA molecular weights agrees nearly quantitatively with the experimental value. Furthermore, we use the simulation to understand how the interaction of the DNA with the solvent leads to thermal migration via the thermal fluctuations-fluid momentum flux coupling.

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