Retraction: Mean scattering angle method for direct simulation Monte Carlo [Phys. Rev. E 105, 015302 (2022)]

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This paper deals with numerical experiments on the single deflection angle of binary collisions in the simulation of normal shock waves by using Bird's DSMC program, DSMC1S.FOR. The author considered the range of deflection to be $0 < \chi < \pi/2$, where χ is the deflection angle, and used a trick to understand the experimental results by introducing a probability density distribution function which gives the mean deflection angle of hard spheres, $\langle \chi \rangle = \pi/2 - 2/\pi$. Later, it was realized that the experiments should be carried out for the angles in the range $0 < \chi < \pi$, and the mean deflection angle should be $\langle \chi \rangle = \pi/2$. Because the mean angle is the main parameter in this work, the use of the wrong $\langle \chi \rangle$ gives the wrong conclusion. The paper is therefore withdrawn; the author regrets any inconvenience.