

Erratum: Medium-Enhanced Polaron Repulsion in a Dilute Bose Mixture **[Phys. Rev. Lett. 135, 113402 (2025)]**

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In this Letter, we did not include the exchange contribution to the bare interaction between thermal bosonic impurities, which enhances this interaction by a factor of 2. As such, Eqs. (5) and (11) from this Letter should be updated to read

$$F_{\text{thermal}} = \frac{4\pi a_{\downarrow\downarrow}}{m} \left[2 - \frac{a_{\uparrow\downarrow}^2}{a_{\uparrow\uparrow} a_{\downarrow\downarrow}} \right] \quad (1)$$

and

$$F_{\mu,\text{thermal}} = \frac{4\pi a_{\downarrow\downarrow}}{m} \left[2 - 2 \frac{a_{\uparrow\downarrow}^2}{a_{\uparrow\uparrow} a_{\downarrow\downarrow}} \right]. \quad (2)$$

No other equations in this Letter were impacted by this omission since our variational approach explicitly assumed degenerate impurities. Thus, all the main conclusions remain the same.

This change impacts the comparison between thermal and degenerate bosonic impurities since, even in the absence of impurity-medium interactions, their quasiparticle interactions differ. We therefore define the medium-induced interaction as F measured from the bare impurity-impurity interaction:

$$F_{\text{ind}} = F - F|_{a_{\uparrow\downarrow}=0} = \begin{cases} F - \frac{4\pi a_{\uparrow\downarrow}}{m}, & \text{degenerate impurities,} \\ F_{\text{thermal}} - 2 \frac{4\pi a_{\uparrow\downarrow}}{m}, & \text{thermal impurities,} \end{cases} \quad (3)$$

where the quasiparticle interaction between degenerate impurities is unchanged from before

$$F = \frac{4\pi a_{\downarrow\downarrow}}{m} \left[1 + \frac{16\sqrt{2}}{3\pi} \frac{a_{\uparrow\downarrow}^2}{a_{\uparrow\uparrow}\xi} \left(1 - \frac{1}{4} \frac{a_{\uparrow\downarrow}^2}{a_{\uparrow\uparrow} a_{\downarrow\downarrow}} \right) \right]. \quad (4)$$

F_{ind} is shown in Fig. 1, which replaces the original Fig. 1 of this Letter.

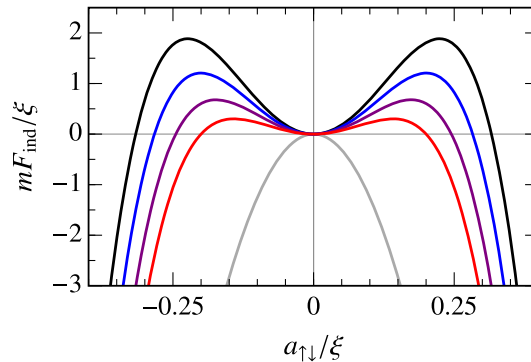


FIG. 1. Medium-induced interaction strength F_{ind} at fixed medium density for degenerate impurities. For all lines, we have $a_{\uparrow\uparrow}/\xi = 0.1$, while we take $a_{\downarrow\downarrow}/\xi = 0.25, 0.2, 0.15$, and 0.1 for the black, blue, purple, and red lines, respectively. The result for thermal impurities, which is independent of $a_{\downarrow\downarrow}$, is shown as a gray line.