Erratum: First-principles study of grain boundary sliding in $\alpha$-$\text{Al}_2\text{O}_3$

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In this paper, shear stresses shown in Fig. 3(b) were 10 times smaller than the correct values. The corrected Fig. 3(b) is shown here. Accordingly, the first sentence in the third paragraph on page 4 should read “From the slope between 4% to 12% and 32% to 43% of the stress-displacement curve [Fig. 3(b)], the theoretical shear modulus of the supercell is estimated to be 320 GPa in region I and 260 GPa in region II, which is approximately 60% and 50% of the shear modulus of $\alpha$-$\text{Al}_2\text{O}_3$ single crystal along [2021] direction (calculated from the same sliding simulation on the perfect $\alpha$-$\text{Al}_2\text{O}_3$ crystal by applying shear displacement along [2021] direction).” The third sentence in the first paragraph of the Summary and Conclusions should read “In addition, theoretical shear modulus of the supercell during GB sliding simulations is approximately 60% of that of the perfect crystal of $\alpha$-$\text{Al}_2\text{O}_3$.” The main conclusion of this paper is that the GB sliding behavior is strongly dependent on the character of the local bonding at the GB core. This conclusion is not changed by present error. This error only affects to the absolute value of the vertical axis of Fig. 3(b).

![Figure 3](image-url)

FIG. 3. (a) GB energy changes as a function of shear displacement in the $\Sigma$13 $\text{Al}_2\text{O}_3$ GB and (b) the corresponding shear stresses obtained from the slope of GB-energy vs shear displacement curve.