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# Thermal conductivity of thermoelectric Al-substituted ZnO thin films

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**Erratum**

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Due to a correction of the temperature oscillation, calculated by the 3$\omega$ voltage, the thermal conductivity of ZnO film is revised ($\kappa = 8.8 \pm 2.1$ Wm$^{-1}$ K$^{-1}$). In particular, the Supporting Information is corrected. Furthermore, the thermoelectric figure-of-merit $ZT$ of ZnO thin films is reduced by one half.



Based on 3$\omega$ voltages, temperature oscillations must be calculated by the following equation [1]:

$$\Delta T = 2\frac{1}{\frac{dR}{dT}} R \frac{U_{3\omega}}{U_{\omega}}. \quad (1)$$

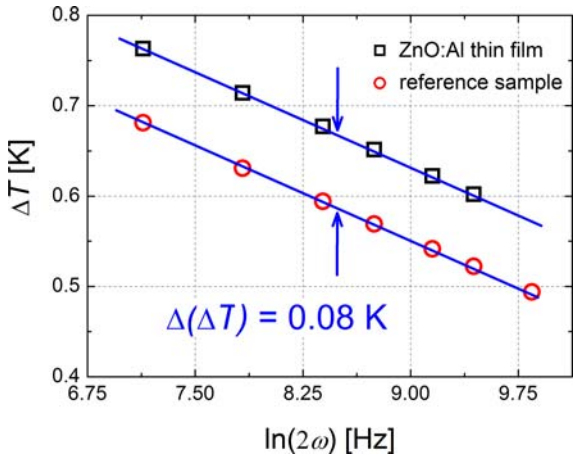


**Figure S1** $\Delta T$ as a function of ln (2$\omega$) for ZnO:Al thin films with a thickness of 950 nm (rectangles) and 120 nm (circles).

Instead of two, the factor four has been wrongly quoted in the Supporting Information as well as applied for calculations in Ref. [2]. Thus, the figure showing the temperature oscillations $\Delta T$ of a ZnO:Al thin film and a reference sample (Supporting Information, Fig. S1) has to be modified as shown here.

The difference in the temperature oscillations between thicker and thinner samples $\Delta(\Delta T)$ results in 0.08 K. Therefore, the cross-plane thermal conductivity of ZnO:Al films had to be re-calculated: $8.8 \pm 2.1$ Wm$^{-1}$ K$^{-1}$.

Following the discussion in the publication, instead of 26%, about 13.5% of the total thermal conductivity is contributed by electrons ($\kappa_{el}$).

Besides, the thermoelectric figure-of-merit $ZT$, shown in Fig. 2 (Ref. [2]), is approximately reduced by one half.

The general finding of an improved performance of the thin films remains unaltered.

### References

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