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## Lattice thermal conductivity of bulk $\text{PtSe}_2$ and $\text{PtTe}_2$

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Thermoelectric devices can play a role in efficiently using available energy by converting heat produced by a wide range of devices into electricity. Low lattice thermal conductivity is a requirement for efficient thermoelectric devices and layered materials offer potential in reducing the lattice thermal conductivity perpendicular to the layers. We present

density functional theory calculations of the structural and thermal properties of layered platinum dichalcogenides  $\text{PtSe}_2$  and  $\text{PtTe}_2$  compounds in the  $\text{CdI}_2$  structure, space group  $P3m1$ . Phonon and elastic constants calculations confirm that the compounds are dynamically and mechanically stable. Lattice thermal conductivities were calculated within the single-mode relaxation-time approximation of the linearised phonon Boltzmann equation. We found that at the room temperature, the in-plane lattice thermal conductivities for  $\text{PtSe}_2$  and  $\text{PtTe}_2$  are  $9.33$  and  $6.54$   $\text{Wm}^{-1}\text{K}^{-1}$ , while perpendicular to the plane they are  $2.06$  and  $1.8$   $\text{Wm}^{-1}\text{K}^{-1}$ , respectively. The out-of-plane thermal conductivities confirm that further investigation of  $\text{PtSe}_2$  and  $\text{PtTe}_2$  as thermoelectric materials is necessary.

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Daniel P. Joubert  
University of the Witwatersrand, Johannesburg, Wits 2050,  
daniel.joubert2@wits.ac.za

**Primary author:** Mr MOHAMMED, Hamza (University of Witwatersrand)

**Co-authors:** Prof. JOUBERT, Daniel (university of the Witwatersrand); Dr NGUIMDO, Dongho (African Institute for Mathematical Sciences-Cameroon)

**Presenter:** Mr MOHAMMED, Hamza (University of Witwatersrand)

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