

Supplemental Information for

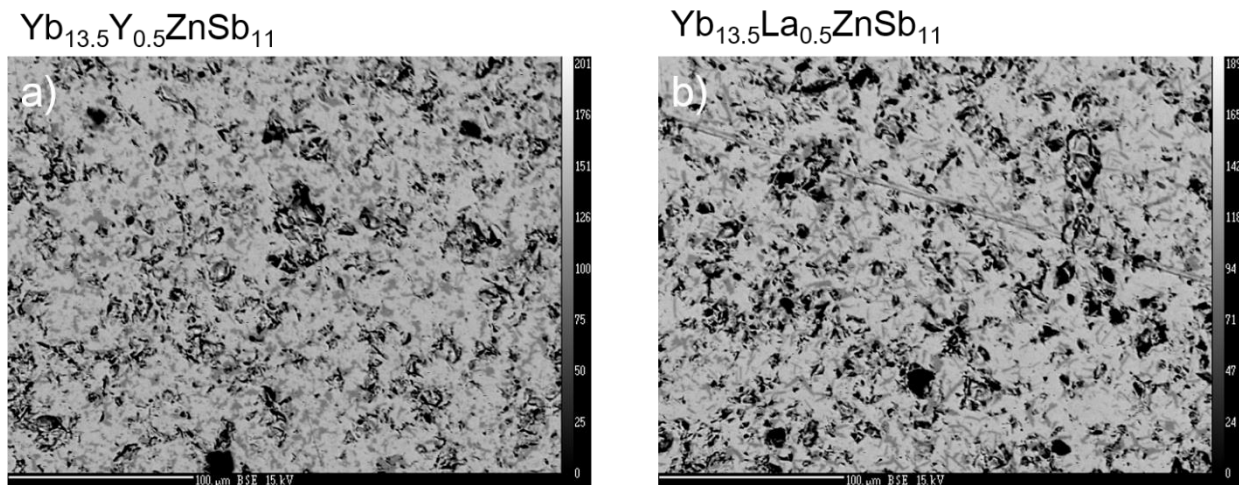
## Seebeck and Figure of Merit Enhancement by Rare Earth Doping in $\text{Yb}_{14-x}\text{RE}_x\text{ZnSb}_{11}$ ( $x = 0.5$ )

Elizabeth L. Kunz Wille<sup>1</sup>, Navtej S. Grewal<sup>1</sup>, Sabah Bux<sup>2</sup> and Susan M. Kauzlarich<sup>1\*</sup>

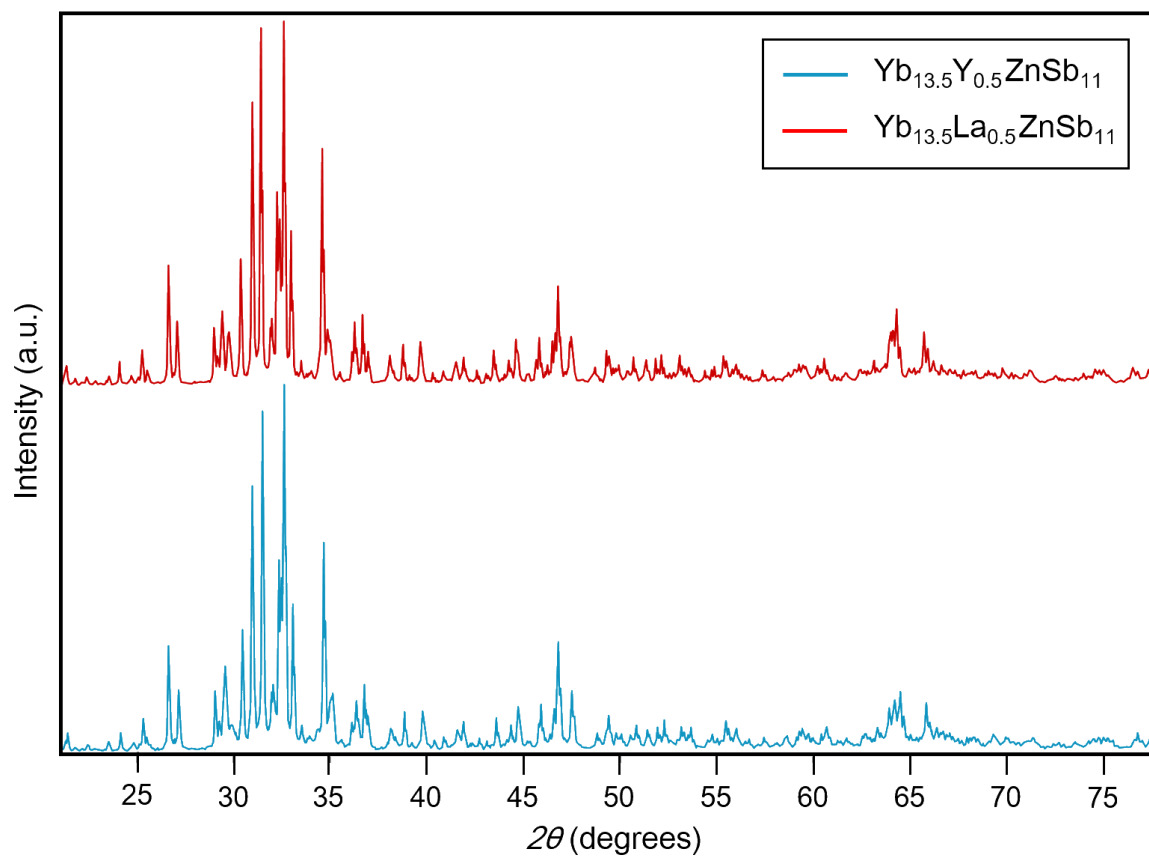
<sup>1</sup> Department of Chemistry, University of California, Davis, One Shields Avenue, Davis, CA 95616

<sup>2</sup> Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109

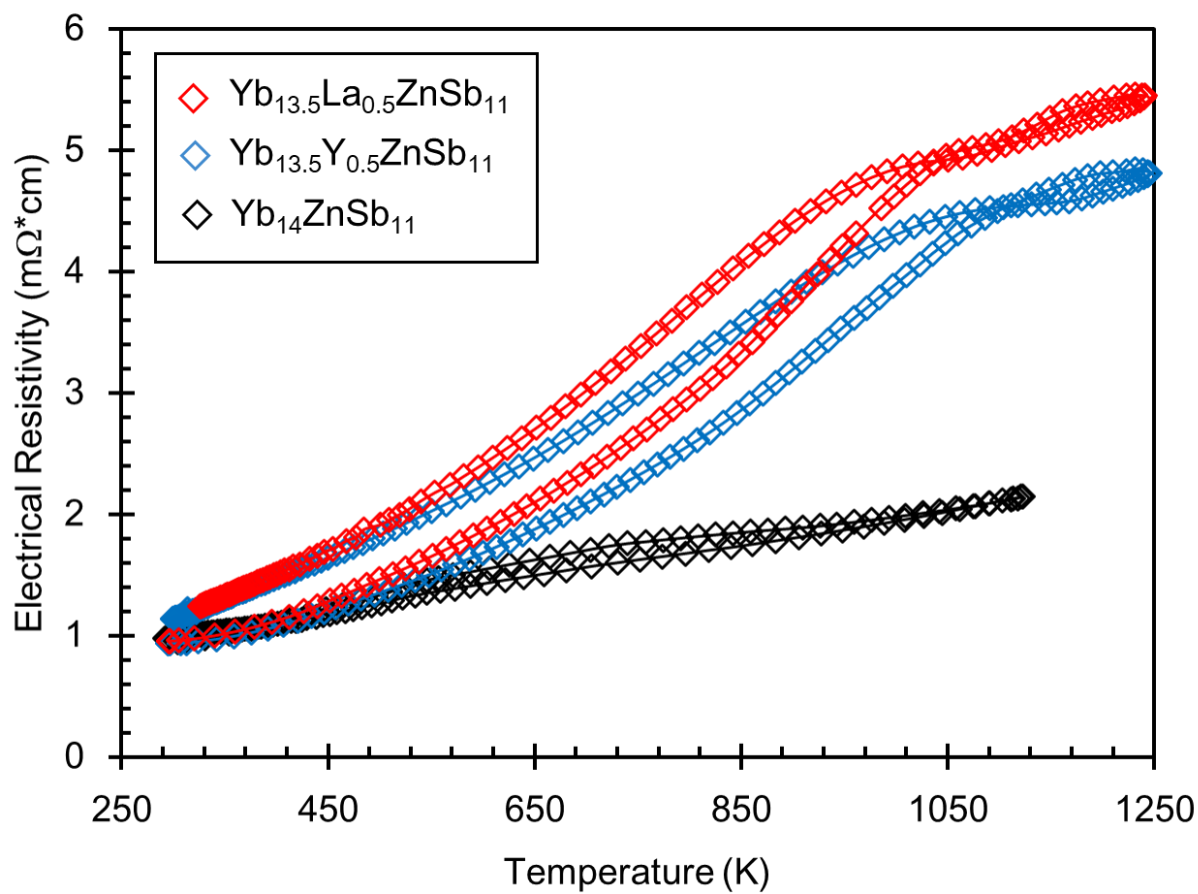
\* Correspondence: smkauzlarich@ucdavis.edu



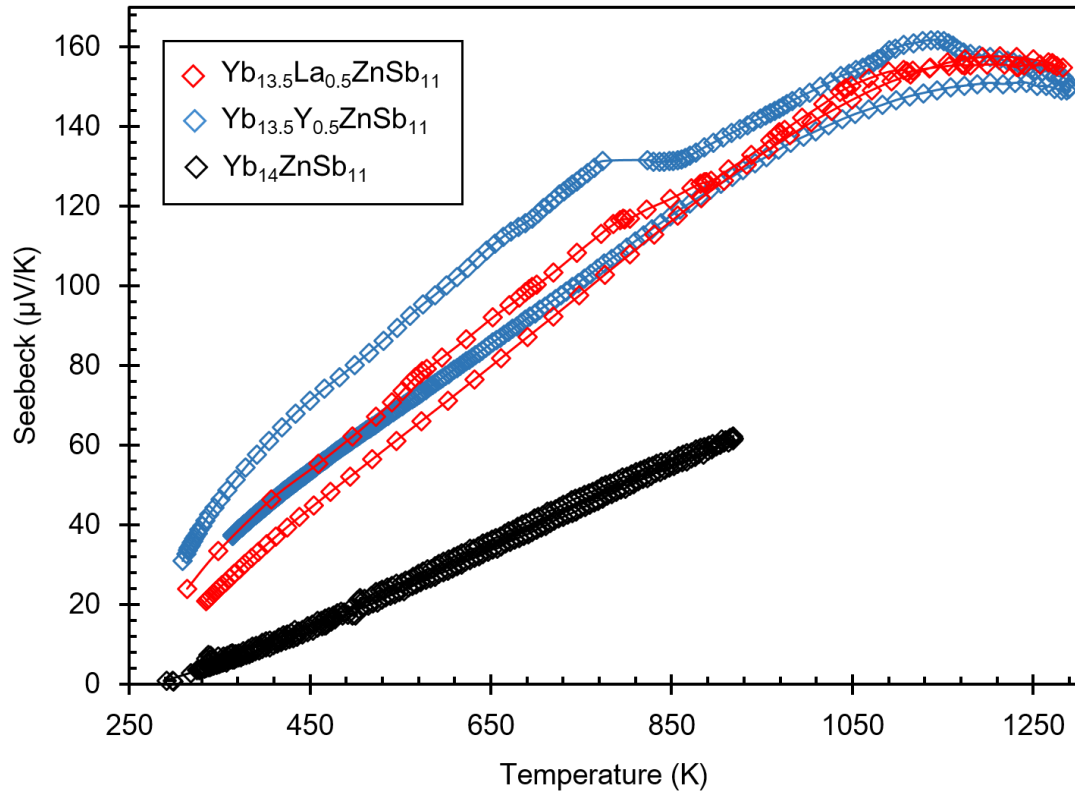
**Figure S1.** Microprobe backscatter electron images of (a)  $\text{Yb}_{13.5}\text{Y}_{0.5}\text{ZnSb}_{11}$  and (b)  $\text{Yb}_{13.5}\text{La}_{0.5}\text{ZnSb}_{11}$ .



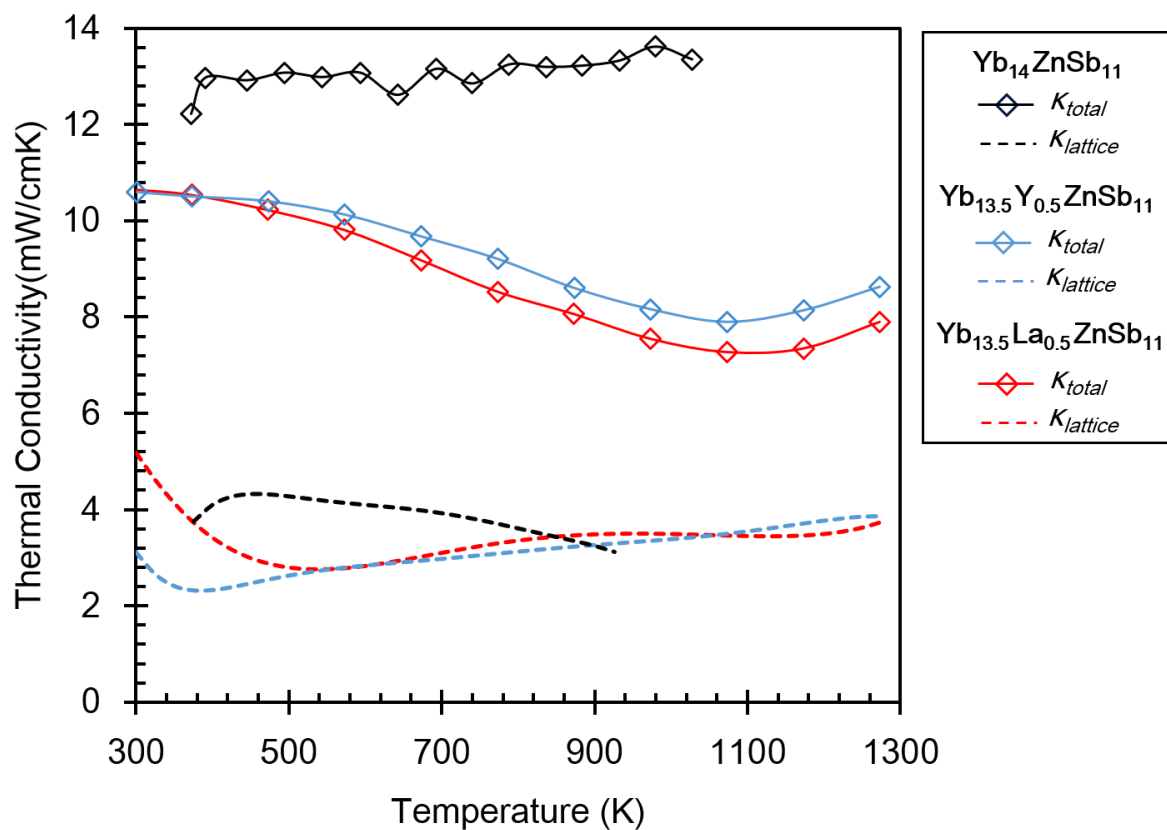
**Figure S2.** Powder X-Ray diffraction patterns from samples of  $\text{Yb}_{13.5}\text{Y}_{0.5}\text{ZnSb}_{11}$  and  $\text{Yb}_{13.5}\text{La}_{0.5}\text{ZnSb}_{11}$ .



**Figure S3.** Electrical resistivity as a function of temperature for samples of  $\text{Yb}_{13.5}\text{Y}_{0.5}\text{ZnSb}_{11}$ ,  $\text{Yb}_{13.5}\text{La}_{0.5}\text{ZnSb}_{11}$  and  $\text{Yb}_{14}\text{ZnSb}_{11}$  (data from Ref. 9).



**Figure S4.** Seebeck as a function of temperature for samples of  $\text{Yb}_{13.5}\text{Y}_{0.5}\text{ZnSb}_{11}$ ,  $\text{Yb}_{13.5}\text{La}_{0.5}\text{ZnSb}_{11}$  and  $\text{Yb}_{14}\text{ZnSb}_{11}$  (data from Ref 9).



**Figure S5.** Total thermal conductivity and calculated lattice thermal conductivity as a function of temperature for samples of  $\text{Yb}_{13.5}\text{Y}_{0.5}\text{ZnSb}_{11}$ ,  $\text{Yb}_{13.5}\text{La}_{0.5}\text{ZnSb}_{11}$  and  $\text{Yb}_{14}\text{ZnSb}_{11}$  (taken from Ref. 9).

9. Brown, S.R.; Toberer, E.S.; Ikeda, T.; Cox, C.A.; Gascoin, F.; Kauzlarich, S.M.; Snyder, G.J. Improved Thermoelectric Performance in  $\text{Yb}_{14}\text{Mn}_{1-x}\text{Zn}_x\text{Sb}_{11}$  by the Reduction of Spin-Disorder Scattering. *Chem. Mater.* **2008**, *20*, 3412–3419.