Electronic Supplementary Material (ESI) for Dalton Transactions.

Probing Co- and Fe-doped $LaMO_3$ (M = Ga, Al) perovskites as thermal sensors.

Olivier Toulemonde, Alexis Devoti, Patrick Rosa, Philippe Guionneau, Mathieu Duttine, Alain Wattiaux, Eric Lebraud, Nicolas Penin, Rodolphe Decourt, Alexandre Fargues, Sonia Buffière, Alain Demourgues and Manuel Gaudon*

Supporting Information

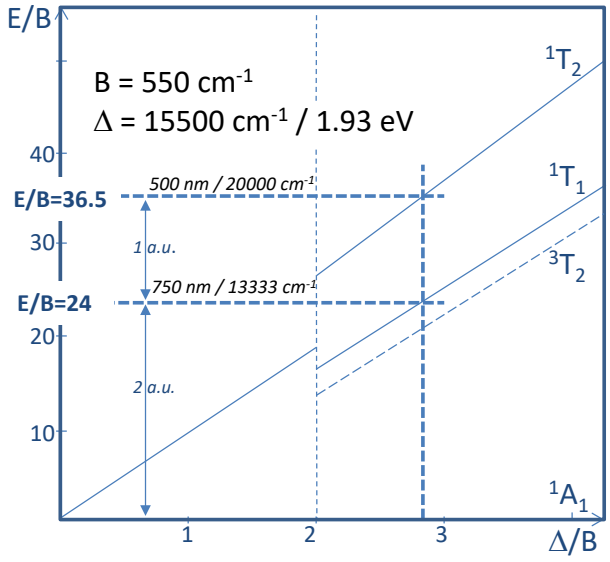

Figure S1: Extraction method of Racah parameter B and crystal field Δ for an attribution of 1st allowed and 2nd allowed transition equal respectively to 750 nm and 500 nm.

The way we have extracted the Racah parameter B and the crystal field is based on a trivial graphic exploitation of the Tanabe-Sugano diagram for *d7* configuration. The above Figure shows that the shoulder of absorbance observed at about 850 nm could correspond to the forbidden transition from $^1A_1$ to $^3T_2$ state.

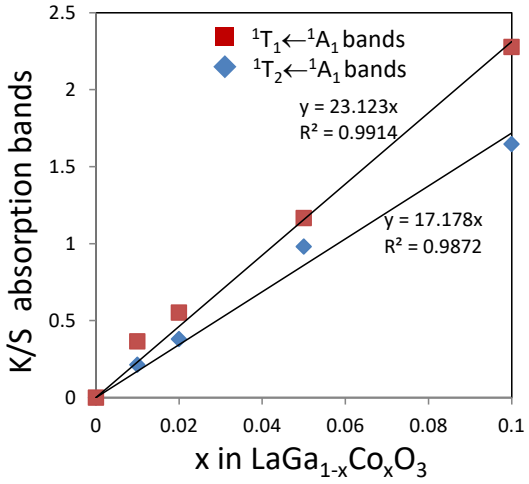

Figure S2: Kubelka-Munk transform ($K/S = (1 - R^2)/(2R)$ with 1-R = A, R: Reflectivity, A: Absorption) of the two absorption bands (after background subtraction) associated with the d-d Co^{3+} ion transitions.

The nearly linear relation between K/S intensities and the doping ion concentration shows non-deviation between the cobalt target concentration and the efficient concentration inside the perovskite material.

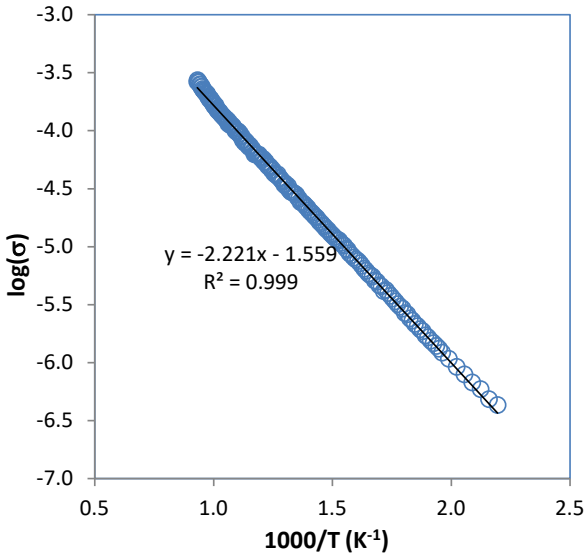

Figure S3: Arrhenius-type plot of the conductance. Data are represented by the open circles and the line is a fit of the raw data considering an activation energy model for the conductance.

Resistivity measurement was carried out using a standard home made four-probe dc technique