Transition metal delafossites: from 2D metallicity to multiferroism

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Delafossite oxides of AMO_2 formula are exhibiting a very broad range of physical properties related to their layered structure. The latter can be viewed as "natural" heterostructures made of alternating triangular A^+ and $(MO_2)^-$ layers. On the one hand, in the case of A=Cu^+ and M^{3+}=3d magnetic cation, multiferroic properties connected to complex antiferromagnetic strutures, as in $CuCrCO_2$ [1], are observed, whereas, on the other hand, as for A=Pd^+ and B=Co^{3+} (d^6, LS, S=0), a very 2D metallic behaviour is evidenced with strong anisotropies of both resistivity and thermal conductivity (Fig.1).
In the presentation, some examples will be chosen to illustrate the richness of the physical properties for these 2D materials [2].

[1] M. Poienar et al, Phys. Rev. B **79**, 014412 (2009).
[2] R. Daou et al, Science and Technology of Advanced Materials**, 18:1**, 919-938 (2017).

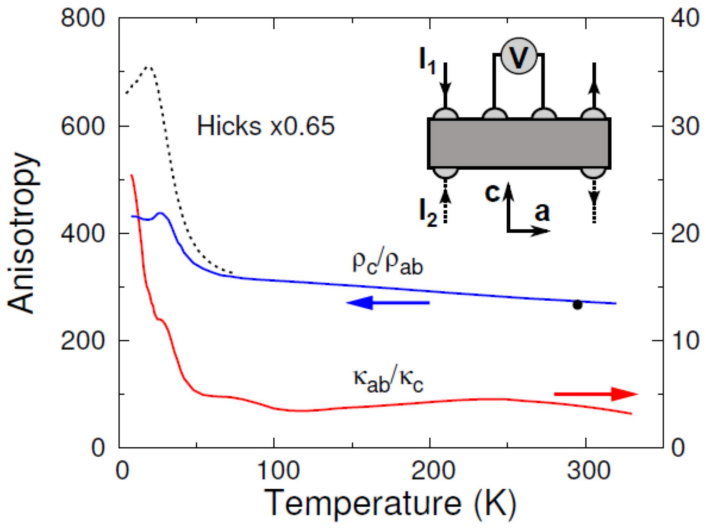

Fig.1: Anisotropic transport in $PdCoO_2$ crystals.