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Review of the Ph.D. thesis "*Dynamic control of magnetization for spintronic applications studied by magneto-optical methods*" by Martin Zahradník, Charles Univerisity in Prague, Faculty of Mathematics and Physics, Institute of Physics supervised by RNDr. M. Veis, Ph.D., Faculty of Mathematics and Physics, Charles Univerisity in Prague.

The thesis contains ca. 96 pages. Chapters dealing with the structure of the investigated oxides, their orbital ordering phenomena (OOR), deformation by strain, theoretical background of magneto-optical effects and experimental techniques amount to first 46 ones, second half roughly is devoted to the investigated ferromagnetic half-metal like LSMO and their measurements including dynamical control of strain. The results deal with compressive as well as tensile strains, that are produced by various lattice parameters of the substrates. In the very end, a list of 10 publications within the last 5 years is itemized.

The outcome of the present thesis resulted just in one publication (in press 2019). The question is whether the other ones mentioned in the list of publication are related to the Ph.D. work or not. Or why the thesis was not written in a way it was build upon it and only to choose one of the subject of these oxides.

Thesis is clearly written with minimal typos, well structured and outlined and easy to read unless the calculations or the analysis of these optical spectra that only discussed in brief and in general. Next, there is too much of the speculation based on the DOS of the first-principles calculations and those actually do not help to interprete here the results in the present form, not adequate at all. Following questions could raise a higher interest into the subject.

Questions and comments:

1. p. 64 Fig. 5.16 and p. 68 Fig. 5.19 How do these spectra of Re and Im eps comply with Kramers-Kroning relations or sum rules?

2. p. 65 Table 5.5 How these oscillators could be located at 0.6eV if you measure only from 0.7eV (see page 63)?

3. p.68 and p. 66 What do you mean by charge transfer vs. optical transition?

4. How did this work differ from the References 103, 105-107, and 111?

5. Fig. 5.22 on page 72 Why only total DOS not the partial one? Why two different smearings are used?

6. Why not the d-f transitions (selection rules allow) are not considered, if the peak position should be at 3eV above Fermi level? At this energy there is a peak.... Where are the 4f states of La?

Typos:

- p 13 Where is the equation 2.45 refering on this page?
- p 75 larher → larger

Conclusion: This Ph.D. thesis is a well approached of the experimental work, however with a bit of somehow expected results with some attempts of optical transition analysis based on the first-principles calculations. As the experimental part is done very well I recommend **this work** for the Ph.D.defense.

In Ostrava, June 17th 2019

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