Contribution ID: **28** Type: **not specified**

7-New coupling mechanisms and exchange bias in ferrimagnetic spin valves

Wednesday 16 February 2022 10:18 (13 minutes)

The exchange bias (EB) effect has become a vital topic of research on the field of spintronics. Numerous device applications like random access magnetic storage units and spin valves rely on it for improved stability in temperature and field. In particular, it has been observed that perpendicular exchange bias (PEB) demonstrates a larger thermal stability for stored information and is consequently more desirable to have in applications. The challenge arises in creating PEB efficiently. In the majority of cases, the PEB is set through field-cooling or by in situ field growth procedures, which are time consuming or not as accessible.
A novel method would be to make use of ferrimagnetic spinvalves, with materials such as CoDy or GdFeCo, which have been proven to exhibit perpendicular anisotropy. At the interface between ferrimagnets, all spin pairs will contribute to the appearance of an EB. If the coupling between ferrimagnetic layers is too strong however, EB cannot occur. To circumvent this, a thin interlayer
spacer is introduced in order to partially decouple the two layers. Thus, the exchange coupling can be tuned through the variation of the thickness of the spacer layer, and a perpendicular exchange bias can be induced and reversed at room temperature.
This method requires further study, namely on the magnetic interactions occurring at the interface and on the choice of spacer. It would be of interest to understand the coupling mechanisms for exchange bias and their dependence on the magnetic properties of the system.

Author: CASEIRO, Mariana (IST/INESC-MN/HZB)

Presenter: CASEIRO, Mariana (IST/INESC-MN/HZB)