

# Dynamics of Magnetic Domain Wall in Ferrimagnets

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Magnetic domain walls, which separate regions of opposing magnetic domains, can be manipulated and used to encode information for storage<sup>1</sup> or to perform logic operations<sup>2</sup>. Owing to these fascinating technological applications, magnetic domain walls have been intensively studied during the last decade. To compete with other technologies, high-speed operation, and hence fast domain wall propagation, is essential. In this talk, we show that it is possible to achieve high domain wall velocity using ferrimagnets. In ferrimagnetic GdFeCo wire, in which the magnetic moments of Gd and FeCo are coupled antiferromagnetically, we observe a drastic increase of domain wall velocity at the angular momentum compensation temperature,  $T_A$ , of ferrimagnet. A maximum field-driven domain wall velocity as high as 2 km/s (wall mobility as large as  $20 \text{ km} \cdot \text{s}^{-1} \cdot \text{T}^{-1}$ ) is obtained at  $T_A$ . The effects of current on the DW motion across  $T_A$  are also investigated and will be discussed in this talk.

## References

- [1] Parkin *et al.* Science **320**, 190 (2008)
- [2] Allwood *et al.* Science **309**, 1688 (2005)]