$Co_{40}Fe_{40}B_{20}/MgO/Co_{40}Fe_{40}B_{20}$ double wedge magnetic tunnel junctions with perpendicular anisotropy

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9.7 cm

We have investigated a $Co_{40}Fe_{40}B_{20}(t_{bottom})/MgO(0.89)/Co_{40}Fe_{40}B_{20}(t_{top})$, crossed double wedge ($t_{bottom}$: 0.66-1.08, t_{top}: 0.99-1.62, thickness in nm), by VSM and MOKE measurements. Therefrom we determined the perpendicular anisotropy, saturation magnetization, coercive field, remanent magnetization and saturation field as a function of the, perpendicularly crossed, thicknesses of the bottom and top CoFeB layers. The highest perpendicular anisotropy is found for the area: $0.89 < t_{bottom} < 0.96$ and $1.05 < t_{top} < 1.12$ (nm). The wafer areas most suitable for pseudo-spin valve magnetic tunnel junctions (PSV MTJs) were used to fabricate circular nanopillars with diameters of $150, 200, 280, 350$ and $400\,\mathrm{nm}$. Preliminary tunnel magnetoresistance (TMR) measurements show an MR ratio of 20% and a very low Resistance-Area (RA) product of $2\,\Omega\mu m^2$. **Acknowledgements** Project supported by the Polish Ministry of Science and Higher Education grants (IP 2010037970 and NN 515544538), and the Foundation for Polish Science MPD Programme cofinanced by the EU European Regional Development Fund. We thank Singulus Technologies AG for sample deposition. Research conducted at the Dept. of Electronics, AGH in the frame the Erasmus-Socrates program.

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