Domains stimulated magnetostatic coupling in NiFe/Au/Co/Au multilayers investigated by complementary methods

F. Stobiecki\textsuperscript{a}, M. Urbaniak\textsuperscript{a}, B. Szymański\textsuperscript{a}, P. Kuświk\textsuperscript{a}, M. Schmidt\textsuperscript{a}, J. Aleksiejew\textsuperscript{a}, T. Weis\textsuperscript{b}, D. Engel\textsuperscript{b}, D. Lengemann\textsuperscript{b}, A. Ehresmann\textsuperscript{b}, M. Kopcewicz\textsuperscript{c}

\textsuperscript{a}Institute of Molecular Physics, Polish Academy of Sciences, ul. Smoluchowskiego 17, 60-179 Poznań, Poland
\textsuperscript{b}Institute of Physics (EP IV) and Center for Interdisciplinary Nanostructure Science and Technology (CINSaT), University of Kassel, Heinrich-Plett-Str. 40, D-34132 Kassel, Germany
\textsuperscript{c}Institute of Electronic Materials Technology, ul. Wólczyńska 133, 01-919 Warszawa, Poland

We report on magnetization reversal of NiFe/Au/Co/Au multilayers characterized by in-plane and out-of-plane anisotropy of NiFe and Co layers respectively. For such films the transition from a weak to a strong ferromagnetic coupling correlated with creation of stripe domains in Co layers is observed. The strengths of this magnetostatic coupling and the magnetic field range in which this coupling exists can be regulated by a proper choice of the ferromagnetic and/or spacer layers thickness. The manifestation of the coupling in magnetization reversal, magnetoresistance, Mössbauer spectroscopy, and soft x-ray resonant magnetic scattering measurements performed for different samples will be discussed. On the basis of these complementary measurements the evolution of the magnetic structure with magnetic field will be described.

\begin{itemize}
  \item Subject category: 5. Nano-structure, Surfaces, and Interfaces
  \item Presentation mode: poster
  \item Corresponding author: F. Stobiecki
  \item Address for correspondence: Institute of Molecular Physics
  Polish Academy of Sciences
  ul. Smoluchowskiego 17, 60-179 Poznań
  Poland
  \item Email address: stfeliks@ifmpan.poznan.pl
\end{itemize}