Characterisation and modelling of a magnetic biosensor

Almeida T.M., Piedade M.S., Cardoso F., Ferreira H.A., Freitas P.P.

INESC-ID, Instituto Superior Técnico, R. Alves Redol, 9, 1000-029 Lisboa, Portugal; INESC-MN, Instituto Superior Técnico, R. Alves Redol, 9, 1000-029 Lisboa, Portugal

Abstract: This paper presents the characterisation and modelling of a magnetic biosensor included on a portable hand-held microsystem for biomolecular recognition (DNA hybridisation, antobody antigen interaction, etc.). The system, which is based on a fully integrated magnetoresistive biochip (fig. 1), uses magnetic field arraying of magnetically tagged biomolecules and can potentially be used to detect single or few biomolecules. The biochip is based on a matrix array of magnetic tunnel junctions and thin-film diodes (fig. 2) which are here characterised and modelled. Experimental results show the proposed models may be used for biochip characterisation and the matrix structure is adequate for the envisaged microsystem. © 2006 IEEE.

Author Keywords: Biochip; Biomolecular recognition; Magnetoresistive sensor; MTJ; TFD

Year: 2006
Source title: Conference Record - IEEE Instrumentation and Measurement Technology Conference
Art. No.: 1700544
Page : 2007-2012
Cited by: 2
Link: Scorpus Link
Document Type: Conference Paper
Source: Scopus

Authors with affiliations:

1. Almeida, T.M., INESC-ID, Instituto Superior Técnico, R. Alves Redol, 9, 1000-029 Lisboa, Portugal
2. Piedade, M.S., INESC-ID, Instituto Superior Técnico, R. Alves Redol, 9, 1000-029 Lisboa, Portugal
3. Cardoso, F., INESC-MN, Instituto Superior Técnico, R. Alves Redol, 9, 1000-029 Lisboa, Portugal
4. Ferreira, H.A., INESC-MN, Instituto Superior Técnico, R. Alves Redol, 9, 1000-029 Lisboa, Portugal
5. Freitas, P.P., INESC-MN, Instituto Superior Técnico, R. Alves Redol, 9, 1000-029 Lisboa, Portugal