



ISTITUTO NAZIONALE DI RICERCA METROLOGICA  
Repository Istituzionale

Influence of lattice defects on the ferromagnetic resonance behaviour of 2D magnonic crystals

*Original*

Influence of lattice defects on the ferromagnetic resonance behaviour of 2D magnonic crystals / Manzin, Alessandra; Barrera, Gabriele; Celegato, Federica; Coisson, Marco; Tiberto, PAOLA MARIA. - In: SCIENTIFIC REPORTS. - ISSN 2045-2322. - 6:(2016), p. 22004. [10.1038/srep22004]

*Availability:*

This version is available at: 11696/54654 since: 2021-02-17T18:27:59Z

*Publisher:*

Nature Research

*Published*

DOI:10.1038/srep22004

*Terms of use:*

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

*Publisher copyright*

(Article begins on next page)

## *Supplementary Information*

### **Influence of lattice defects on the ferromagnetic resonance behaviour of 2D magnonic crystals**

A. Manzin<sup>1</sup>, G. Barrera<sup>1,2</sup>, F. Celegato<sup>1</sup>, M. Coïsson<sup>1</sup> & P. Tiberto<sup>1</sup>

<sup>1</sup>Istituto Nazionale di Ricerca Metrologica (INRIM), Torino, Italy

<sup>2</sup>Università degli Studi di Torino, Dipartimento di Chimica, Torino, Italy

Corresponding author:

Dr. Alessandra Manzin

Istituto Nazionale di Ricerca Metrologica

Strada delle Cacce, 91

10135 Torino, Italy

tel. +39-011-3919825

e-mail: [a.manzin@inrim.it](mailto:a.manzin@inrim.it)

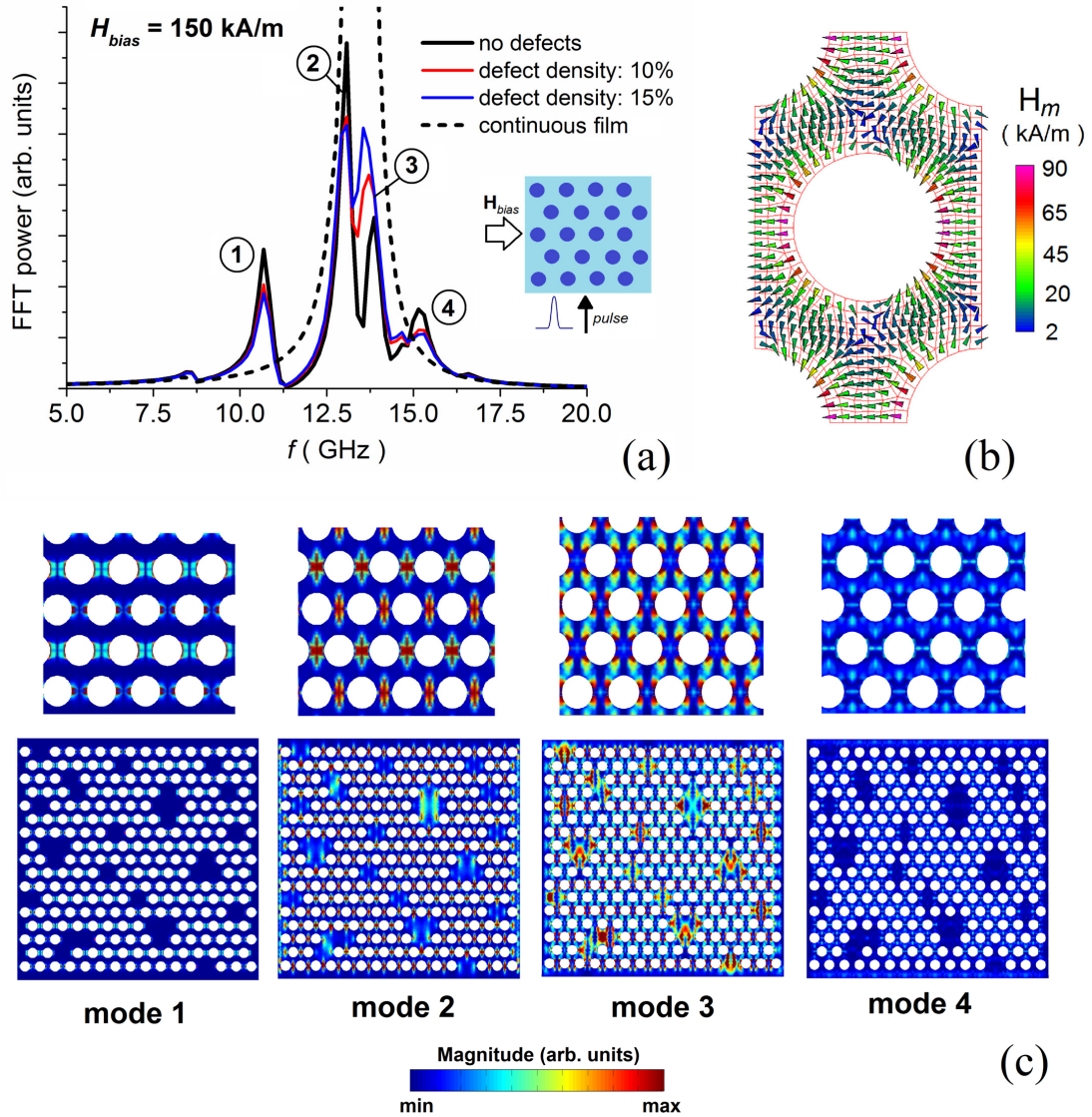


Fig. S1 (a) FFT power spectra of the average magnetization component parallel to the excitation field ( $y$ -axis), calculated for a bias field of 150 kA/m oriented along  $x$ -axis: comparison of disordered arrays with different percentages of filled holes to the corresponding ordered one and continuous film. The inset shows external field conditions. (b) Spatial distribution of demagnetizing field in the unit cell of the ordered antidot array. (c) Surface plots of the magnitude of Fourier coefficients for the FMR modes indicated in (a), calculated for the disordered structure with 10% of filled holes (bottom) and relative magnification for the ordered structure (top).

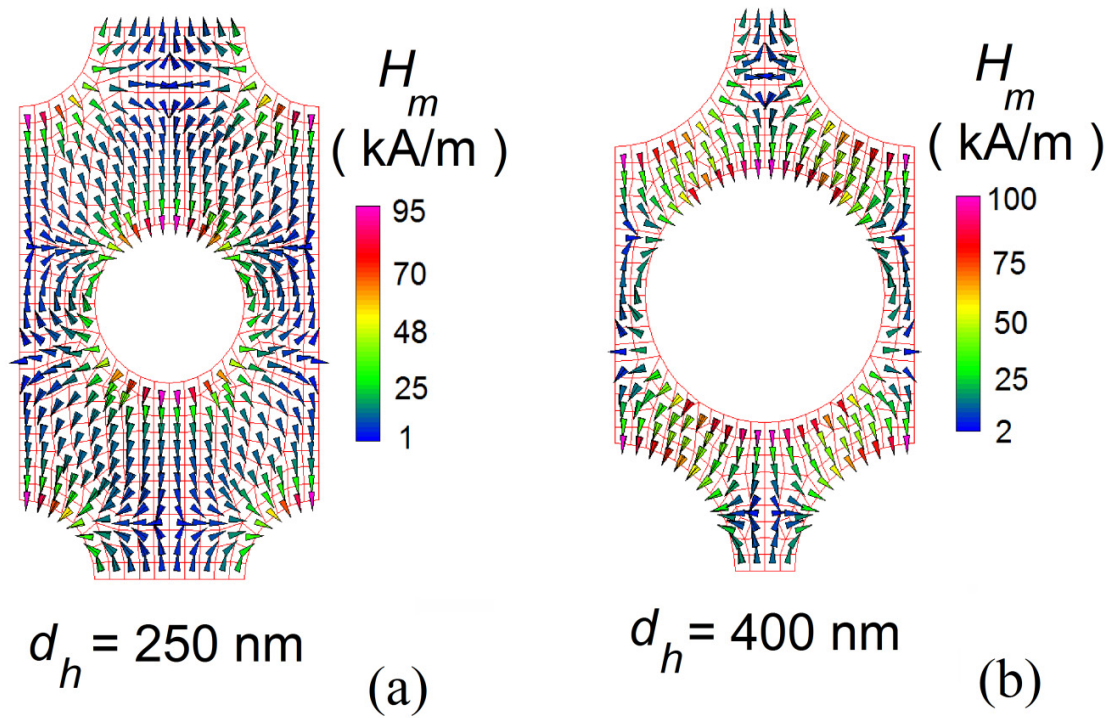


Fig. S2 Calculated spatial distributions of the demagnetizing field in the unit cell of ordered antidot arrays with hole diameter  $d_h$  equal to (a) 250 nm and (b) 400 nm. The corresponding magnetization configuration (quasi-saturation) has been determined by applying a dc field of 150 kA/m along the  $y$ -axis direction.

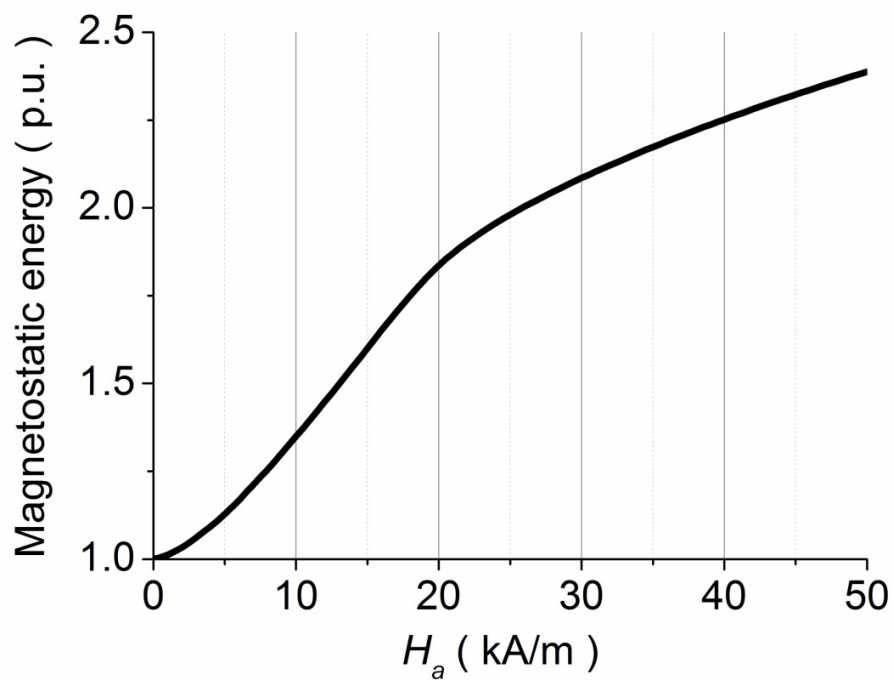


Fig. S3 Evolution of the magnetostatic energy versus applied field associated with the  $y$ -axis static hysteresis loop of the ordered antidot array, reported in Fig. 3b of the manuscript.