

マテリアル先端リサーチインフラ利用報告書

ARIM User's Report

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課題データ / Project Data

課題番号 Project Issue Number	22NU0263
利用課題名 Title	Unidirectional thermal conductivity enhancement in yttrium Iron garnet due to the effect of spin waves
利用した実施機関 Support Institute	名古屋大学 / Nagoya Univ.
機関外・機関内の利用 External or Internal Use	内部利用 (ARIM事業参画者以外) / Internal Use (by non ARIM members)
横断技術領域 Cross-Technology Area	加工・デバイスプロセス/Nanofabrication
重要技術領域 Important Technology Area	量子・電子制御により革新的な機能を発現するマテリアル/Materials using quantum and electronic control to perform innovative functions
キーワード Keywords	リソグラフィ/Lithography,スパッタリング/Sputtering

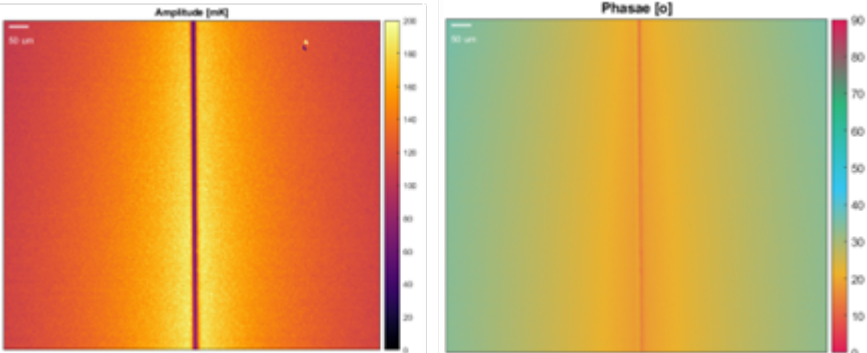
利用者と利用形態 / User and Support Type

利用者名 (課題申請者) User Name (Project Applicant)	上野 藍
所属名 Affiliation	名古屋大学大学院工学研究科
共同利用者氏名 Names of Collaborators in Other Institutes Than Hub and Spoke Institutes	
ARIM実施機関支援担当者 Names of Collaborators in The Hub and Spoke Institutes	
利用形態 Support Type	機器利用/Equipment Utilization

利用した主な設備 / Equipment Used in This Project

利用した主な設備 Equipment ID & Name	NU-208 : 両面露光用マスクアライナ NU-222 : レーザー描画装置 NU-245 : スパッタリング装置
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報告書データ / Report

<p>概要 (目的・用途・実施内容) Abstract (Aim, Use Applications and Contents)</p>	<p>The main objective of this research is detecting and measuring the asymmetric thermal conductivity enhancement due to the interaction between electrons, spin waves and phonons. For that, a measurement technique is developed based on lock-in thermography technique to prove and quantitatively measuring this enhancement. Accordingly, a metallic line heater configuration at nano-scale needs to be deposited on the surface of the measured material by photolithography and sputtering techniques.</p>
<p>実験 Experimental</p>	<p>The laser mask writer Heidelberg DWL66FS is used to write a Cr mask of the heater configuration. The mask aligner MA-6 is then used for the photolithography process. After that, the sputtering device E-200S is used to deposit a Cr layer 5 nm as an adhesive layer and 50 nm of Au to construct the configuration of the line heater.</p>
<p>結果と考察 Results and Discussion</p>	<p>Fig.1 shows an example of the locked-in temperature field in term of amplitude and phase form a line heater deposited on SiN. By analyzing the temperature field. The asymmetric thermal conductivity can be estimated. In this study, we could measure the asymmetric thermal conductivity using Lock-In Thermography and nano-fabrication.</p>
<p>図・表・数式 1 Figures, Tables and Equations 1</p>	 <p>Fig.1 An example of the locked-in temperature field. Amplitude(Left) and Phase(Right) .</p>
<p>その他・特記事項 (参考文献・謝辞等) Remarks(References and Acknowledgements)</p>	<p>None</p>

成果発表・成果利用 / Publication and Patents

<p>DOI (論文・プロシーディング) DOI (Publication and Proceedings)</p>	
<p>口頭発表、ポスター発表 および、その他の論文 Oral Presentations etc.</p>	
<p>特許出願件数 Number of Patent Applications</p>	<p>0件</p>
<p>特許登録件数 Number of Registered Patents</p>	<p>0件</p>