

PhD in Materials Science and Technology

Research Title: Microwave properties of novel magnetic materials

Funded by	Position without scholarship
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Contact	http://rime.inrim.it/nanosienze-e-materiali/ https://scholar.google.it/citations?user=jSf77jsAAAAJ&hl=en
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Context of the research activity	<p>Design and use of pure or composite components containing magnetic materials and nanoparticles is in rapid development due to the wide variety of existing and potential applications in electronics and in transportation where low-cost, lightweight and high strength materials are required more and more for energy saving purposes. For example embedding micro and nanoparticles in a well known polymer-based component allows one to include additional electromagnetic functionalities at low cost without inducing a significant decrease of mechanical and thermal properties. Polymer-based nanocomposites with high dielectric constant are already well known for applications in high speed electronics and antennas, which allow improvements in the bandwidth and size reduction of components. In this specific case it is possible to exploit their absorption properties in order to realize hot melt adhesives or microwave absorbers, by the proper combination of the nanoparticles and the polymer matrix. The research activity will be focused on experimental, analytical parts and some modeling. Materials will be prepared, treated and measured at INRIM/Polito and associated laboratories</p>
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Objectives	<p>The research activity will be focused on experimental, analytical parts and some modeling. Experiments will be connected to electromagnetic characterization (permeability and permittivity) of different materials in a very wide frequency range (DC to several GHz).</p>
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Skills and competencies for the development of the activity	Basic experimental interest/skills are required, programming connected to instrument interfacing preferred. Working English proficiency (oral/written) required. Some knowledge of microwave theory and experimental techniques is preferred
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