

This project aims to improve materials used in modern communication systems, particularly for 5G and 6G technologies. These materials are crucial for devices that direct electric signals, such as isolators and circulators, but they often lose too much energy, reducing their effectiveness. It is also often not clear how to cheaply assess a material's quality. The project seeks to make these materials and measurement techniques better by understanding how different properties affect their performance.

As we move towards more advanced networks, there is a growing need for materials that work well at higher frequencies, such as those used in 5G and 6G. By improving these materials, we can develop smaller and more efficient communication devices. The project's main goal is to understand how different characteristics of these materials, like their magnetic and elastic properties, interact and affect each other. By studying these relationships, researchers hope to find ways to reduce energy losses and improve efficiency.

The research involves creating and testing various materials, including special types of ferrites and thin metal films. These materials will be made using advanced techniques to achieve the best possible properties. Precise instruments will be used to measure how these materials behave under different conditions. Studies of how the materials respond to magnetic fields and mechanical stress, as well as how they interact with electromagnetic waves will be performed.

Understanding the connections between these properties is essential. By examining how different characteristics influence performance, the project aims to identify the best ways to enhance these materials. The findings will help design better materials, leading to more efficient and compact communication devices.

This research will not only improve communication technologies but also have potential applications in areas like medical devices, aerospace, and defense. The project is a collaborative effort, bringing together experts in various fields to achieve groundbreaking results. By advancing our knowledge and capabilities in these materials, the project aims to support the development of faster, more reliable, and more efficient communication networks.