A New Class of Hybrid Dipole Waves

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In recent years, the physics of electromagnetic metamaterials has been actively studied. In magnonics (one of the most dynamically progressing fields of the modern physics of magnetic phenomena), the creation of controllable magnetic metamaterials is also based on implementing a system of locally resonating and electromagnetically coupled structural elements (spins) Up to now, the main attention in this field has traditionally been focused on the usage of potentialities provided by the magnetic-dipole and exchange types of spin waves.

We have demonstrated that a previously unknown class of hybrid dipole waves (magnetoelectric magnons) and the additional resonances related to them can be formed in a magnetoelectric layer (for the special structure of magnetoelectric interaction tensor).