

Foreword

Metamaterials

-The Challenge of New Materials Design-

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This special issue, entitled "Metamaterials and Automotive Applications", is based essentially on the results of the research undertaken by the Sato research group of the Frontier research division. Our mission is to remain at the vanguard of our field through endless creativity, inquisitiveness and the pursuit of improvement (The Toyota Precept). The Frontier research division further rises to the challenge of enhancing our originality and pursuing pioneering research.

Metamaterials are a new class of ordered composites that exhibit unusual electromagnetic properties that are not readily observed in nature. There is currently considerable interest in the development of metamaterials, with particular emphasis on double-negative materials for microwave and optical applications. I believe that research in the area of metamaterials will lead to new methods of materials design. We are presented with the possibility of bettering conventional design methods and developing higher-performance automotive devices. Our research has just started. The majority of the challenges remain ahead of us.

I hope that you enjoy this special issue!