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Artificial Material Composites for Potential Sensor Applications

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Artificially structured composites, also known as meta-materials can emerge with unusual electromagnetic (em) properties. Owing to Transformation Optics (TO) a variety of em-devices with extraordinary pre-designed functions can be defined. As the development of meta-materials progresses, many novel em-devices designed with TO have been experimentally demonstrated and used in specific applications.
One of the potential applications is to utilize the Cherenkov effect by means of manipulating the radiator medium. One of the media's desired property is to anomalously and largely tune light scattering in an ultra-compact volume and concurrently achieve excellent performance. As a consequence, small volumes might be exploited and relatively cheaply and with small efforts implemented. However, a variety of challenges have to be controlled and extensive R&D must be conducted to realize such implementation. In this presentation, we will discuss the challenges and possible realizations.

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