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Modeling of Electromagnetic Phenomenon in Fractional Dimensional Space MUHAMMAD ZUBAIR, L.K. ANG, Engineering Product Development, Singapore University of Technology and Design, East Coast Campus, 8 Somapah Road, Singapore 487372, Singapore — Fractional dimensional space has emerged as an extremely useful concept in many areas of physics, including electromagnetic (EM) theory. The development made in the area of fractional calculus has made it possible to study the most important physical phenomenon in a generalized D -dimensional fractional space. It is worthwhile to mention that many natural objects, such as clouds, snowflakes, rough surfaces, cracks, turbulence in fluids, are aptly described by dimensions of fractional order. Therefore, EM wave propagation in such fractal media is best characterized by considering an effective space of non-integer (fractional) dimensions. Here we present the recent developments in the study of differential Maxwell equations in a D -dimensional fractional space, where D is a non-integer value. Some examples will be used in order to show the transition to the traditional non-fractional conditions or settings.

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