Abstract Submitted
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What's the Meta?[1] EDL SCHAMILOGLU, MIKHAIL FUKS, University of New Mexico — The term "Metamaterial" was first coined in 1999 by Rodger Walser, University of Texas [B. Munk, *Metamaterials: Critique and Alternatives* (John Wiley & Sons, New York, NY, 2009)]. His definition is as follows: *Metamaterials are macroscopic composites having man-made, three-dimensional, periodic cellular architecture designed to produce an optimized combination, not available in nature, of two or more responses to specific excitation.* He chose "meta" as the prefix from the Greek work meta meaning beyond. The taxonomy of meta-materials is a problem. It seems that there is no one satisfactory definition that does not restrict a class of worthy meta-materials. This presentation reviews past work on the interaction of high power electromagnetic radiation with 1-D photonic crystals. The purpose of this work was to demonstrate the use of a dielectric to focus the microwave wavebeam and to reflect it quasi-optically. In these experiments using a short pulse SINUS-6 accelerator-driven backward-wave oscillator (BWO) no deleterious effects of the high power electromagnetic fields were observed on the photonic crystal. In addition, planned experiments for an overmoded BWO whose slow wave structure is made from individual wires will be described. This latter has novel mode selection features, in addition to high power handling capability.

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