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Breakdown insensitive acceleration regime in a metamaterial accelerating structure

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Structure-based wakefield acceleration (SWFA) is a proposed concept to overcome limitations in conventional accelerators. This approach allows for the creation of short-input radiofrequency (rf) pulses, which have been empirically shown to reduce breakdown rates at a given gradient. Metamaterial structures with negative group velocity have shown promise in accelerator applications. A structure wakefield experiment, with a metamaterial accelerator, exploited the direct benefits of operation in the short-pulse regime because of the existence of an operational regime, the breakdown-insensitive acceleration regime (BIAR), where disturbances in secondary pulses are observed but the main acceleration pulse is still intact. In this talk, the experimental results and dark current simulations of the metamaterial accelerator will be presented.

Working group

WG4 : Novel structure acceleration

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