

## Resonance shift in relativistic traveling wave amplifiers

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We examine analytically the linear operation of relativistic traveling wave tube amplifiers. In this regime it is found that the maximum growth rate occurs at a beam velocity below that expected on the basis of resonance with the cold dispersion relation of the slow wave structure. The maximum growth rate can be much larger than that at the resonance condition. These results have significance when extending Pierce's theory to traveling wave amplifiers driven by relativistic electron beams.

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