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Local Field Effect in Smith-Purcell Radiation from Dotted Grating

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In this report we theoretically investigate the effect of interaction between separated elements of 2D dotted grating and its influence on SPR characteristics. The developed approach allows us to calculate the macroscopic radiation properties proceeding from the microscopic properties of the grating [M.I. Ryazanov, A.A. Tishchenko, JETP (2006)]. We show that the local field effects can change significantly the spectral-angular distribution of SPR. In particular, the described near-field resonances, which are responsible for such a change, lead to significant increasing in radiation intensity.

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