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## Synchrotron radiation properties of elliptically polarized undulator with a transverse field gradient

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Elliptically polarized undulator (EPU) plays an essential role in providing circularly polarized light from the third generation to upcoming synchrotron light sources. To meet the demand of energy tuning, the operation is also discussed to change from the adjusted gap method to the adjusted phase method in many of the designs. However, the adjusted phase operation causes a transverse field gradient (TFG) which may exceed 100T/m. In addition to studying the TFG characteristics of EPU, our work also investigates how TFG affects synchrotron radiation (SR) using Gaussian approximation. With our results, one can know the effect of TFG on SR using the magnetic field characteristics obtained during the design stage. We also confirmed the validity of above methods and results by numerical simulation.

### Funding Agency

### Footnotes

### I have read and accept the Privacy Policy Statement

Yes

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