



Contribution ID: 2110 Contribution code: SUPG008

Type: Student Poster Presentation

## Study and simulation of cryogenic photonic-band-gap disk-loaded structure

*Sunday, May 19, 2024 2:00 PM (4 hours)*

In order to enhance the accelerating gradient of accelerators, cryogenic accelerating structures have been investigated. Based on material characteristics and technical conditions, a fundamental design has been accomplished. Photonic band-gap (PBG) structures employ a lattice of rods to impede the propagation of RF field through the lattice at specific frequencies while effectively damping higher order modes. The design of the single-cell PBG structure has been refined by altering the shape of the rods surrounding the defect region in order to mitigate peak surface magnetic field within the structure. The combination of PBG cells and a bi-periodic accelerating structure has resulted in the design of a novel structure. This innovative configuration possesses the advantageous characteristics of a bi-periodic structure while incorporating the additional functionality of a PBG structure to effectively damping higher order modes.

### Footnotes

### Funding Agency

Work supported by the Alliance of International Science Organizations (ANSO-CR-KP-2020-16) and the National Natural Science Foundation of China (No. 12175292).

### Paper preparation format

LaTeX

### Region represented

Asia

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**Session Classification:** Student Poster Session

