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## Zooming optics in HEPS beamline design

With the reduction of the emittance of electron bunches in new generation synchrotron radiation sources, the generated X-ray beam is beneficial for applications with high spatial resolution, coherence, and flux, bringing opportunities for the design of multifunctional beamlines. Considering the partial coherent characteristics of the light field, the achievement of experiments requiring flux and coherence on the same beamline is important research. This paper studies the ZOOMing, or two-stage focusing configuration, aiming to control the coherence and the spatial resolution. The high-coherent field is obtained by limiting the field through a slit, The relationship between the coherence or flux and the range of the field is investigated to meet experimental requirements. We also present the zoom beamline design method based on geometric optics, including cascade focusing and secondary focusing. Taking into account the change in coherence, cases of both diffraction-limited and system-limited focusing are considered separately. Finally, the numerical experiments by wave propagation are also carried out to verify the design.

### Journal of Synchrotron Radiation Special Issue: will you submit your contribution?

yes

**Primary authors:** Prof. LI, Ming (Institute of High Energy Physics); Prof. ZHANG, Xiaowei (Institute of High Energy Physics); Ms ZHANG, Dongni (Institute of High Energy Physics); YANG, Fugui (Institute of High Energy Physics); Ms LIU, Fang (Institute of High Energy Physics)

**Presenter:** YANG, Fugui (Institute of High Energy Physics)

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