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Beam-ion Instabilities and Their Mitigation for SOLEIL II

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Beam-ion instabilities belong to a broader class of two-beam instabilities caused by the interaction of a primary beam (electron or hadron bunches) with a secondary beam (ion or electron cloud). The transverse oscillations of these beams can couple with each other. Their amplitude will grow, leading to beam losses. These instabilities can limit the operation of fourth-generation light sources with low emittances and high intensity. Many existing light sources, including synchrotron SOLEIL, are conducting upgrade studies towards fourth-generation light source parameters. This contribution investigates beam-ion instability and potential mitigation measures in SOLEIL II. The instability threshold is determined with analytical estimations and particle tracking results. The trapping of ions in the primary electron beam is discussed for the current lattice design. Differences between different numerical models of this beam-ion interaction are briefly discussed.

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Footnotes

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Yes

Primary author: GUBAIDULIN, Vadim (Synchrotron Soleil)

Co-authors: GAMELIN, Alexis (Synchrotron Soleil); NAGAOKA, Ryutaro (Synchrotron Soleil)

Presenter: GUBAIDULIN, Vadim (Synchrotron Soleil)

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