

Call for Papers

IEEE Journal of Selected Topics in Quantum Electronics **Special issue on Self-Injection Locked Lasers and Associated Systems**

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Scope and Topics

IEEE Journal of Selected Topics in Quantum Electronics (JSTQE) invites manuscript submissions on the applications of self-injection locking (SIL) in electronics and photonics. The SIL technique plays a crucial role in RF and microwave oscillators, lasers, and photonic systems, where exceptional frequency stability and low phase noise are paramount. While SIL has been studied for decades, recent advancements in photonics—particularly in all-optical locking of lasers to photonic integrated circuit (PIC) microcavities and delay lines—have significantly revitalized its relevance.

The ongoing development of heterogeneously integrated lasers on PIC platforms has driven the need for new stabilization methods that leverage PIC components. Traditional phase locking techniques, such as Pound-Drever-Hall locking, pose integration challenges due to their reliance on electro-optical modulators, fast low noise photodetectors, as well as low noise electronic circuits. In contrast, SIL oscillators achieve frequency stabilization by aligning their emission frequency with the high-quality factor (Q-factor) cavity mode, ensuring effective and robust locking without any electronics use. Remarkably, the locking frequency range in SIL systems can surpass the cavity's bandwidth by several orders of magnitude, with the primary limiting factor being the spectral width of the laser's optical gain medium.

This call for submissions seeks contributions that explore the theoretical and practical aspects of SIL across various domains, including electronics, photonics, opto-mechanics, and electro-optics. Topics of interest include, but are not limited to:

- Fundamental Physics of Self-Injection Locking
- Phase and Amplitude Noise Reduction
- Frequency Stabilization Mechanisms
- Tuning Linearity and Signal Quality Enhancement
- Size, Weight, and Power (SWaP) Optimization
- High-Frequency System Applications
- SIL-Based Sensors and Frequency References

As self-injection locking continues to gain traction in next-generation electronic and photonic systems, this special issue aims to provide a comprehensive overview of recent advances, emerging challenges, and future prospects in the field. Researchers and industry experts are encouraged to submit original research articles, review papers, and experimental studies that contribute to the advancement of SIL technology and its diverse applications.

Submission Guidelines

Submissions will be reviewed in accordance with the normal procedures of the Journal and papers must be formatted according to the Information for Authors found at:

<https://ieeephotonics.org/publications/journal-of-selected-topics-in-quantum-electronics/>

- Manuscript and [Graphical Abstract Submissions](https://ieeephotonics.org/publications/journal-of-selected-topics-in-quantum-electronics/) should be made online at <https://ieeepublish.org/journal/jstqe-pho>. Graphical abstracts are required.
- Select the paper type “**Special Issue on Self-Injection Locked Lasers and Associated Systems**”.

Important Dates

Open for Submissions: June 1, 2025

Submission Deadline: December 1, 2025

Tentative Publication: Sept/Oct 2026

EARLY ACCESS: DOI-citable articles will be published online after acceptance upon submission of final files and rights selection – sometimes well in advance of issue publication.

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