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Upgrades of S-band Accelerating Structures and Pulse Compressors in the Electron and Positron Injector Linac of KEK

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New S-band disk-loaded TM_{01-2π/3}-travelling-wave structures and pulse compressors have been developed for upgrades of the injector linac for SuperKEKB and Photon-factory storage rings in KEK. The structures 2-m long have ingenious disk irises with oval fillets reducing discharge in high-power operation and modulations in radius suppressing beam break-up instabilities arising from HEM₁₁ wakefields. The pulse compressors are of compact spherical-cavity-type resonating at the degenerate TE₁₁₂ dipole modes with a high Q-value of 98,000 and yield a peak power gain of 6.2. The structures generate an acceleration gradient of 25.9 MV/m in power operation of 40 MW by using the pulse compressor and stably accelerate a two-bunch beam with a bunch charge of 4 nC.

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Footnotes

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Yes

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