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Adaptable gun pulser suitable for single bunch and programmed multibunch top-up and fill of storage ring light source

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Diamond Light Source has been operating in top-up mode for users since late 2008. To date, Diamond's electron gun has operated in single-bunch mode for multiple-shot top-up of user beam, and multibunch mode for storage ring fill. The uneven bunch-to-bunch charge of the multibunch train is visible in the storage ring and so the fast multibunch fill must be followed by a slower single bunch correction before beam can be given to users. A new pulser has been developed that will generate a flat, fast-rising 500 MHz train of electron bunches from the gun that will enable a uniform fill of the storage ring without single bunch correction. Arbitrary bunch-by-bunch shaping of the train can be used for multibunch fill and top-up of any required fill pattern, thus exploiting the greater charge available in multibunch mode to reduce the number of top-up shots and consequent disturbance to users. Pulser development and results are presented, together with a report of progress towards multibunch top-up.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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