Optimising the Injection Scheme for DIAMOND from a 3 GeV Booster Synchrotron.
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CLRC Daresbury Laboratory, Warrington, WA4 4AD, UK - The proposed 3 GeV light source DIAMOND will utilise a full energy injector synchrotron operating at a frequency of up to 10 Hz. A requirement of the injection scheme is to minimise the space allocated to its components that could otherwise be exploited for synchrotron radiation output. A multi-turn system using four kickers in a single straight has been compared with the alternative, but less attractive, distributed kicker scheme relying on the lattice quadrupoles to create the required injection bump amplitude; high energy light sources elsewhere have been forced to adopt the latter solution. The associated septum magnet specification has also been assessed. At 3 GeV both schemes make significant demands on the pulsed septum and kicker magnet technology. The consequences for the necessary properties of the extracted beam from the booster are also examined.