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An OSC Experiment in IOTA at Fermilab

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A proof-of-principal optical stochastic cooling (OSC) experiment will take place in the Integrable Optics Test Accelerator (IOTA) at Fermilab. OSC is a technique that may yield cooling rates orders of magnitude faster than what is achievable with presently used microwave-based stochastic cooling systems, and can thus play an important role in future high luminosity machines. In OSC light from an undulator (the pick-up) is superimposed in an identical downstream undulator (the kicker). Cooling is achieved by controlling the phase between the radiation fields from the pick-up and kicker undulators and special arrangements in the beam optics. We present here the latest developments in the light optics design and discuss major principles of OSC operation.

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