



## Saturation of Backward Stimulated Scattering of Laser in the Collisional Regime

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### Abstract

The VPIC code has been converted to run on the hybrid Roadrunner architecture and served as one of the key codes during the Roadrunner Phase 3 acceptance. Access to 6.7M hours on the full Roadrunner system during the initial “shakedown” phase is requested for state-of-the-art VPIC kinetic plasma modeling of laser-plasma interaction (LPI) to study the nonlinear kinetics of stimulated Raman and stimulated Brillouin scattering in the collisional regime. These calculations are important from a basic physics standpoint and they are relevant to upcoming fusion ignition experiments on the National Ignition Facility. LDRD funding support is requested for: (1) further VPIC diagnostic development, (2) relevant, smaller-scale two-dimensional (2D) simulations on quadq on Redtail to isolate the key collisional physics and gain confidence in vital subsystems such as MPI and I/O, (3) prepare relevant scientific calculations for a LANL Gordon Bell Prize submission in late Spring, 2008, (4) verification and validation in the LPI collisional regime with large-scale 3D simulations on Roadrunner.