

“Bivoj / DiPOLE” as a pump source for high repetition rate laser particle accelerators

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The laser system “Bivoj” built on “DiPOLE” cryogenically cooled multi-slab technology (150J / 10Hz / 10ns) has been enhanced by a conversion module for second harmonic frequency generation (95J/10Hz @515nm) with 79% conversion efficiency. This allows the laser to be used as a pump source for short pulse beamlines (CPA or OPCPA) that can be used for efficient particle acceleration. Achieving such high conversion efficiency at high average power laser system was allowed by successful mitigation of depolarization effects, which inevitably occur in such types of laser amplifiers and significantly decrease polarization homogeneity. Additionally, a recent incorporation of large aperture high average power Faraday isolator into the “Bivoj” chain allows use of the laser for direct particle generation experiments.

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