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Relativistic laser-matter interactions explored with the PW Ti:Sapphire laser at CoReLS

Recent advances in ultrashort high-power laser technology have prompted the rapid progress of high-power laser science. High-power femtosecond lasers reaching an output power over 1 PW have been built or being developed in a number of institutes around the world. A PW Ti:Sapphire laser beamline with an output of 30 fs, 1 PW has been operational at GIST since 2010. With the second PW laser beamline with 1.5 PW output finished in 2012 the Center for Relativistic Laser Science (CoReLS) has been launched as a part of Institute for Basic Science established recently to boost basic science. The research at CoReLS is focused on experimental and theoretical investigations of relativistic laser-matter interactions. In this presentation the recent research results, including laser wakefield electron acceleration and radiation pressure acceleration of protons, and research program at CoReLS will be introduced.