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Laser and plasma accelerator research for high energy physics at the BELLA Center

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The BELLA Center has been pursuing laser and laser-plasma accelerator (LPA) research for high energy physics. One of the ultimate goals is to provide a building block for future linear colliders. At the flagship 1-Hz 1-PW laser facility, the development of a 10-GeV class LPA module is ongoing, and such modules in series are envisioned as the path to a high energy collider at TeV energies and beyond. To achieve the desired luminosities required for such a collider, high repetition-rate (tens of kHz) laser sources are needed. To meet these requirements, the BELLA Center is pursuing a promising technology based on the coherent combining of fiber lasers. In this presentation, the current status of those researches are discussed.

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