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## Shintake Monitor : Nanometer Beam Size Measurement and Beam Tuning

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The Shintake Monitor (IPBSM) is a laser interferometer –type beam size monitor installed at the virtual interaction point of ATF2, a test facility for ILC. It is the only currently existing system capable of measuring electron beam sizes below 100 nm, and plays a role in achieving some of ATF2s major goals; realizing the 37 nm design vertical beam size and verifying a novel final focus system featuring the Local Chromaticity Correction.

A laser interference fringe is formed as a Compton scattering target with the electron beam. The resulting signal photons are detected in a downstream detector. Modulation depth of the signal is measured, from which beam size is calculated.

From its first debut at the FFTB, Shintake Monitor has been upgraded to accommodate the smaller ATF2 beam sizes. Improved laser optics and operation modes enable a more flexible measurable range of 25 nm –6  $\mu\text{m}$ , with satisfactory resolution. A new gamma detector with a special multilayer design effectively separates signal from BG.

Shintake Monitors outcomes are indispensable to ATF2, which in turn affect directly the likelihood of ILC being realized.

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