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Alignment and commissioning of the APS beamline front ends

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Ten out of forty phase one beamline front ends have been installed into the storage ring tunnel at the 7-GeV Advanced Photon Source. A four-step alignment process has been designed for the front-end installation, which includes: 1) prealign the front-end components with support tables in the preassembly area, 2) install the components with tables in the storage ring tunnel and align them with the APS global telescope survey net, 3) confirm the alignment using a laser “see through” alignment system, and 4) final adjustment with synchrotron radiation beam commissioning.

The laser alignment system, as well as the prealignment database, has been of great importance to the front-end fast maintenance. This is very important to a large synchrotron radiation facility, such as the APS, because the alignment system and the database make possible the easy set up of a quick alignment confirmation and they minimize the in-tunnel alignment time.

In this paper, the four step front-end alignment process, as well as the laser alignment system setup, are presented. A detailed analysis of the alignment confirmation results is also discussed.

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