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J-PARC Center

The Observation of the Gold Target at the Hadron Experimental Facility

On December 12 and 13, we observed the gold target at the Hadron Experimental Facility by a fiberscope for the first time after the radioactive material leak accident that occurred at Hadron Experimental Facility on May 23, 2013.

As we reported previously, it has been considered that the target was damaged and partially evaporated by an accidental injection of a large amount of protons for a very short period (i.e., 5 micro sec.), and several simulations were carried out.

During the observation, we verified: 1) a hole 1 mm in diameter at a downstream end of the gold target, 2) gold-colored nubs, which probably are traces of dripped out melting gold from slits of a gold rod of the target, 3) probably droplets of melted gold on the copper base block and 4) traces of sprayed out melting gold on a beryllium window at the downstream of beam. Please note that these droplets marks are observed only on the right side of the target as viewed from the downstream.

These observations nicely match with our simulation results. Consequently, we consider that, at the injection, temperature of the gold target partially exceeded melting and further vaporizing points, and melted gold was pushed outward due to a rapid volume expansion resulted from vaporization of the melted gold.

