

The Combination of NIMROD and ISiS

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NIMROD is a nearly 4pi detector system that consists of a 4pi neutron ball, 96 Ionization Chamber-Si-CsI modules in the forward 8 rings from 3.6 degree to 47 four rings with 46 CsI, Ionization Chamber and several Si detectors covering backward angles theta from 47 degrees to 170 degrees, four rings with 46 CsI, Ionization Chamber and several Si detectors covering backward angles theta from 47 degrees to 170 degrees (Fig. 1). It is designed for detecting the products of nuclear reactions

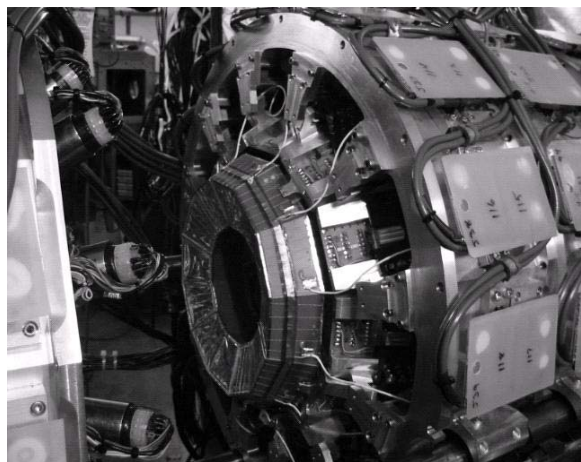


Figure 1: NIMROD.

induced by intermediate energy heavy-ion projectiles. Many experiments have been done in the last two years using this detector system to explore nuclear thermodynamics, nuclear fragmentation, and critical phenomena in heavy-ion nuclear reactions [1].

ISiS is a 4pi spherical detector with low-energy threshold that was constructed at Indiana University and designed for studying the nuclear fragmentation process by the high-energy light particle induced reactions [2]. This detector

system has given many interesting results on nuclear reaction dynamics [3].

After achieving its mission at Indiana University, ISiS comes to TAMU. The backward hemisphere of ISiS (Fig. 2) will be used to replace the backward detectors of

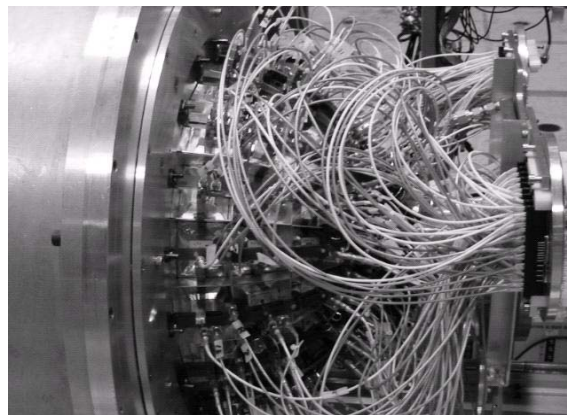


Figure 2: ISiS backward hemisphere.

NIMROD in order to improve detection of low-energy heavy fragments at backward angles. ISiS hemisphere contains four rings, and each ring has 18 truncated pyramidal telescopes constituting of a gas ionization chamber, a 500um Silicon detector and a 28 mm CsI (TI) crystal read out by a photodiode. All of Silicon and CsI detectors have been tested using Cf source and cosmic ray. Most detectors still work well. The next step is to mate this hemisphere of ISiS to the forward rings of NIMROD and test in beam. The software for power supply control for the ISiS ionization chambers, Silicon detectors, and photodiodes also needs some work to transfer it from the VAX system to the Linux system that we are using for NIMROD. This system will provide a significant

improvement for detection of ejectiles at backward angles.

References

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- [3] Charles Seif, Science Vol. **295**, 603(2002).