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Nuclear Astrophysics with low-energy RI beams at CRIB

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Astrophysical reactions involving radioactive isotopes (RI) often play an important role
in explosive stellar environments. Although the RI are seldom seen on the earth due to
the finite lifetime, they do exist in stars, and contribute to the evolution and thermal
dynamics of stellar objects. Experimental efforts have been made for the studies on such
RI-involving reactions.

CRIB (CNS Radioisotope Beam Separator) is a low-energy RI beam separator
operated by Center for Nuclear Study, the University of Tokyo, located at the RI beam factory (RIBF) of RIKEN
Nishina Center.
Various experimental projects based on interests for nuclear astrophysics have been
carried out at CRIB, forming international collaborations.
The present status of CRIB, including the new developments for the RI beams, is reported.
Recent projects of astrophysical reaction studies with RI beams at CRIB are also discussed;

1) Trojan Horse Method measurement for the 7Be+n reactions which may affect the
7Be abundance in the Big-Bang nucleosynthesis, to find
a solution for the cosmological 7Li abundance problem.

2) Resonant scattering measurement for the 22Mg(alpha, p) reaction, which affects the light curve of X-ray
bursts.

3) Direct measurement of the 26Si(alpha, p) reaction, another relevant RI reaction in X-ray bursts.

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