BigRIPS analysis workshop
11 September 2014, RIKEN Wako Campus

Overview of BigRIPS

- Major features of the BigRIPS fragment separator
- RI beam production procedure at the BigRIPS

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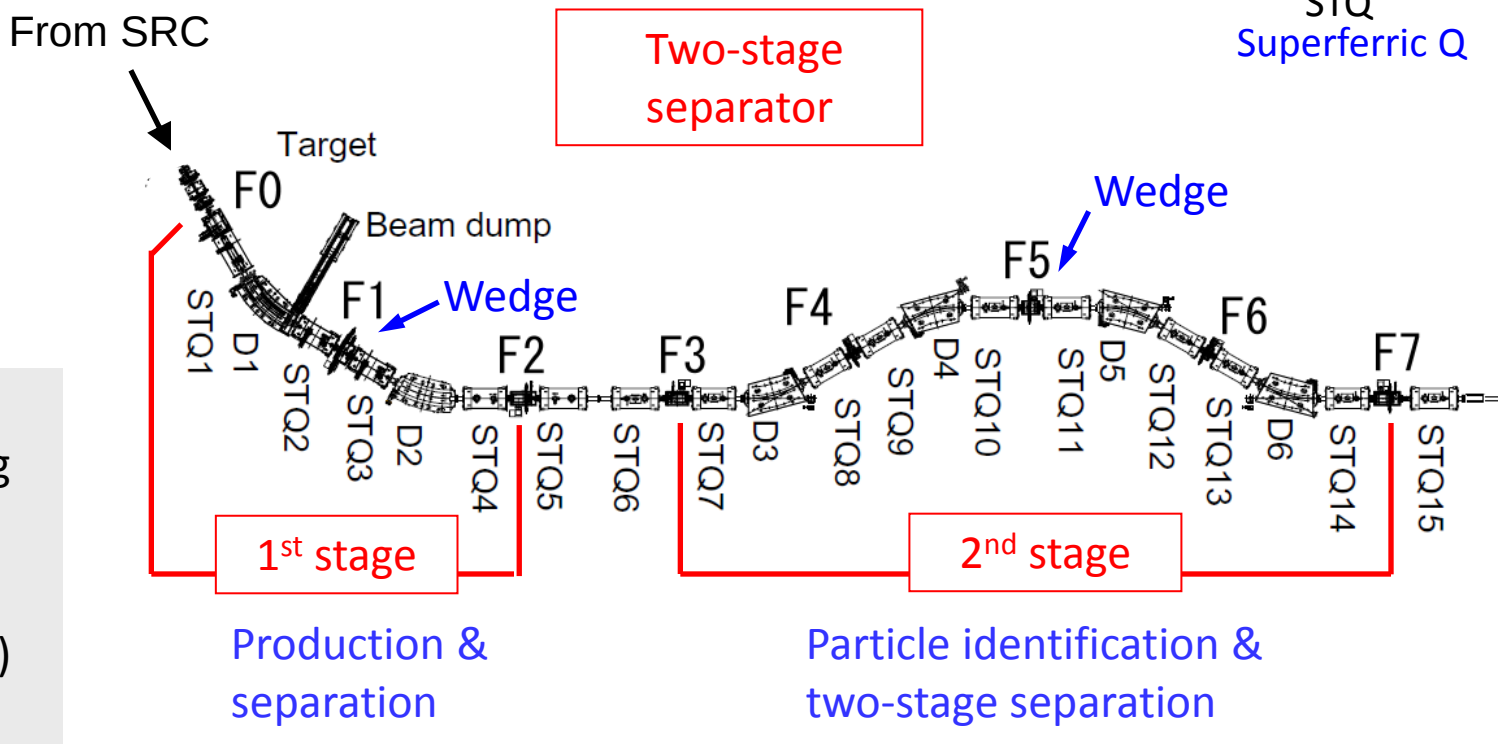
Major features of the BigRIPS fragment separator

- Large acceptances
  - Comparable with spreads of in-flight fission at RIBF energies: ±50 mr, ±5%
- Superconducting quadrupoles having a large aperture
  - Pole-tip radius = 17 cm, pole tip field = 2.4—2.5 T
- Two-stage separator scheme
- 2nd stage with high resolution
  - Particle identification without measuring TKE ← charge states

STQ
Superferric Q

Parameters:
$\Delta\theta$ = ±40 mr
$\Delta\phi$ = ±50 mr
$\Delta p/p$ = ±3 %
$B\rho$ = 9 Tm
L = 78.2 m

STQ1—14:
Superconducting Q triplets
D1—D6:
Dipoles (30 deg.)
F1—F7: Focuses

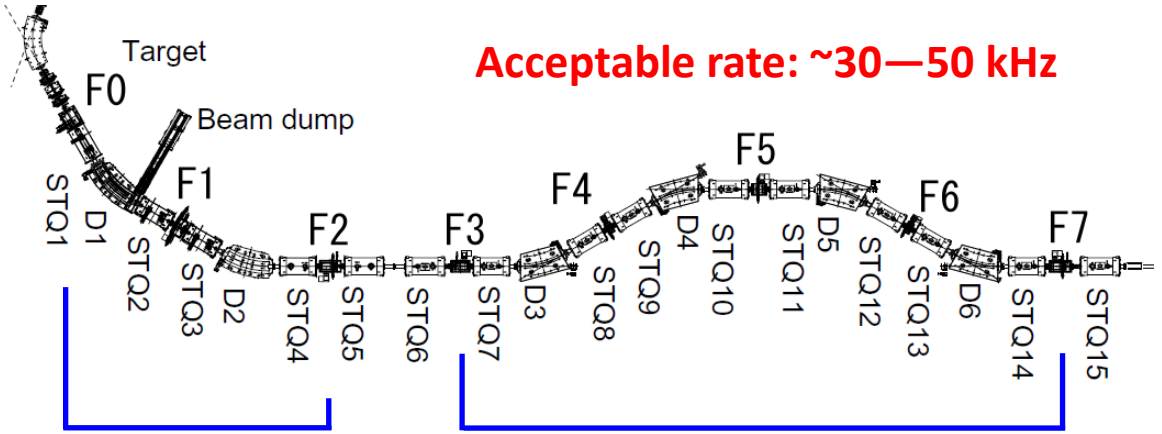


RI beam production procedure at the BigRIPS

Before experiment
- ✓ BigRIPS setting (LISE++ simulation)

In experiment
- ✓ Detector and electronics tuning
- ✓ Particle identification
- ✓ Ion-optics tuning
- ✓ Optimization (rate, purity)
- ✓ Production yield measurement

After experiment
- ✓ PID optimization (if necessary)
- ✓ Production yields, cross sections



Acceptable rate: ~30—50 kHz

Ion-optics tuning

⇩

Good separation

Ion-optics tuning

⇩

Good PID($B\rho$) resolution
Good separation
(in two-stage separation mode)

- ❖ Magnetic field of BigRIPS magnet (H. Takeda)
  - Ion-optical calculation based on detailed magnetic field map
- ❖ Ion optics of BigRIPS separator (H. Suzuki)
  - Overview of ion optics of the BigRIPS separator
  - Ion-optics tuning
- ❖ Particle identification at BigRIPS and its optimization in the off-line analysis (N. Fukuda)