

Study of Electric Field and Turbulence using Heavy Ion Beam Probe (HIBP)

Proposal of International Cooperation for Transport Study

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Joint study is planned based on the
'Agreement on Scientific Exchange and Cooperation between NIFS and PPPL'

Available Components (Hardware)

Three complete sets of HIBP systems

High energy beam sources (1 x 500 keV, 2 x 200 keV)

Three sets of energy analyzer system (beam detectors)

32 computer-controlled high voltage power supplies
(for steering and guiding beams)

Physics Objectives


Electric Field Physics Study

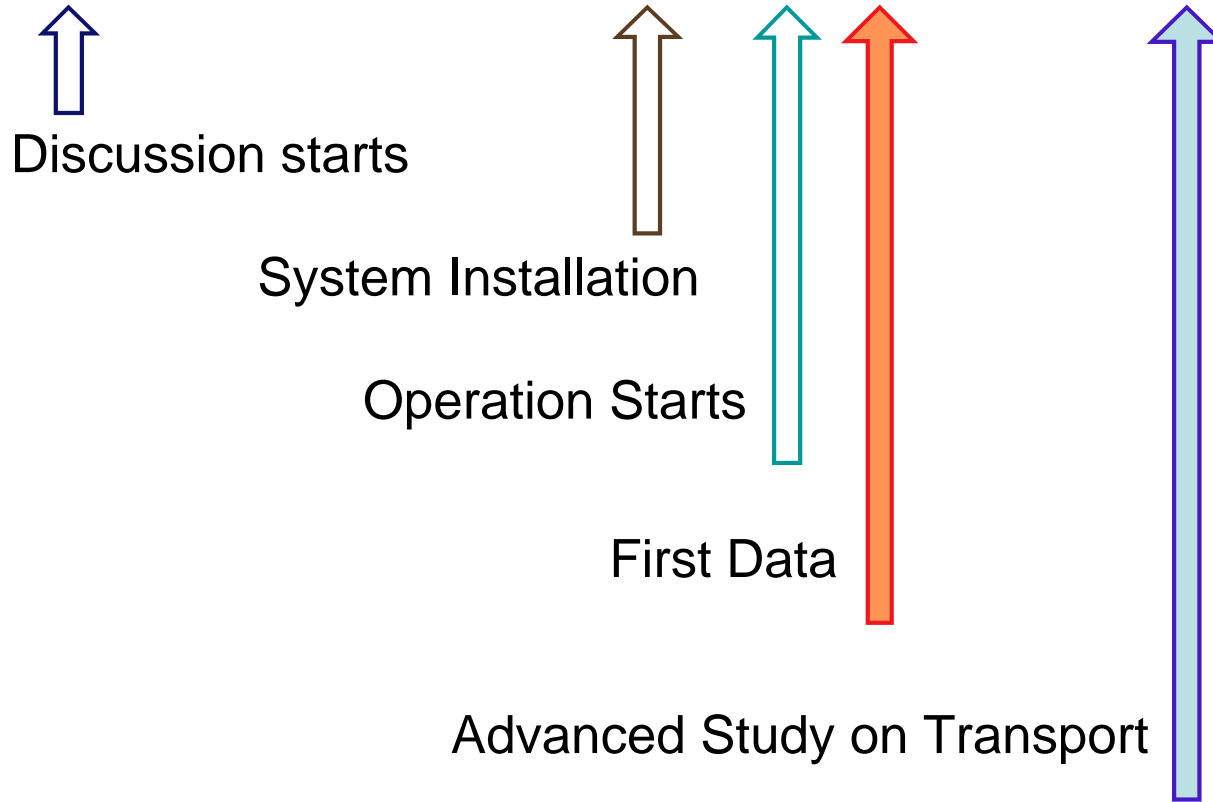
- Roles of electric field for improved confinement
- Dynamics of electric field in the formation of transport barriers
- Mechanism of electric field formation in the intermediate configuration between axisymmetric and non-axisymmetric ones

Turbulence Transport Study

- Turbulence induced particle flux measurements
- Turbulence suppression with the formation of transport barriers
- Zonal flow structure in the quasi-axisymmetric configuration
- Effect of helical ripples on zonal flow

Time Schedule

FY-06	FY-07	FY-08	FY-09	FY-10	FY-11	FY-12	FY-13
Fabrication Project Phase 1 & 2 Equipment			1	2	3		4
			1st Plasma 				
			Phase 2 Equipment				
					Full field, more diags.		
					Full PFCs & divertor		



Necessary Works (Tasks) to start the Cooperation

1. Organize research teams (both Japanese side and U.S. side)
2. Beam trajectory calculation. Determine basic primary and secondary beam orbits.
3. Allocate HIBP ports (for primary beam and secondary beam)
4. Design attachments for installation of HIBP system
5. Various administrative negotiation for making relatively long stay of Japanese team in PPPL possible