

FKPPL Project report (2011)

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ID: Title	A_RD_ATF2: Collaboration between KNU and LAL on the ATF2 project at KEK					
Project Leaders	French Group			Korean Group		
	Name	Title	Affiliation	Name	Title	Affiliation
	<u>Philip Bambade</u>	DR2	LAL	<u>Eun-San Kim</u>	Prof.	KNU
Funding from France within LIA						
Description	Euro/unit	Nb of units	Total (euros)	Provided by: *		
Contribution to cost of visit to LAL by Si-Won Jang in September 2011	500	1	500	IN2P3		
Visit to ATF2 beam line at KEK in November 2011 by two LAL engineers (S. Wallon, F. Bogard) for inspection and survey of IP region where new vacuum chamber built by LAL will be installed to house IP-BPMs provided by KNU.	4000	1	4000	IN2P3		
Contribution to cost of workshop at LAL on ATF2 IP-BPM, March 19-20, 2012	500	1	500	IN2P3		
Total			5000			
Funding from Korea						
Description	Won/Unit	Nb of units	Total (Won)	Provided by: **		
Sending the 3 IP-BPM to LAL for installation to vacuum chamber at LAL	0.5 MWon	1	0.5 MWon	KOSEF		
Contributions to this LAL-KNU collaboration: March 19-20 workshop	2 MWon	2	4 MWon	KOSEF		
Total			4.5 MWon			
Additional funding (outside LIA)	Funding from France			Funding from Korea		
	Provided by: ***	Type	Euro	Provided by: ***	Type	Won

* For example: IN2P3, CEA. ** Korean University or Institute. *** French Embassy, STAR, PICS, other grants...

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Summary of 2011 activities	<p>Since March 2011, ATF2 teams at KNU and LAL have made significant progress with:</p> <ol style="list-style-type: none">1) The preparation of the set of new low-Q IP cavity beam position monitors (BPM) planned at the interaction point (IP) with a resolution of a few nanometers.2) A feasibility and parameter study of radiation hard semi-conductor sensors to be installed after the IP to measure the beam halo and the distribution of recoil electrons from Compton scattering off the laser beam used for beam size measurements. <p>The collaboration between the KNU and LAL ATF2 teams has up to now concentrated on the BPM work (item 1). Improved electronics and a new compact and light-weight mechanical design for the cavity BPMs have proceeded at KNU. Testing for validation is planned in a test area in the upstream part of the ATF2 beam line in the 16th-23th Jan. 2012. Three new IP-BPMS will be tested in the ATF linac beam in March 2012. Through results of these beam tests, the design and fabrications of the BPMs and electronics will be finalized.</p> <p>Meanwhile, a new external vacuum chamber to enclose and support the new set of BPMs produced by KNU is being designed at LAL, including remotely controlled position adjustments for alignment and calibration at the micron level. These are essential for beam based alignment and positioning within the dynamic range of each unit. Final validation and preparation for fabrication are planned in the first months of 2012. In parallel, the KNU BPMs will be shipped to LAL for subsequent pre-installation in the LAL chamber, 3D measurement and vacuum testing before final shipment to KEK later in 2012 (following the general schedule of the IP-BPM project).</p> <p>In March 2011, the KNU group hosted Philip Bambade for detailed technical discussion on the IP-BPM specifications and for an undergraduate level seminar in the KNU Physics Department, on the ILC and on related accelerator physics challenges. In September 2011, the LAL group hosted Si-Won Jang for detailed technical discussions, including LAL mechanical engineers, and for a seminar in the LAL Accelerator Department on the IP-BPM project. In November 2011, two LAL engineers (Sandry Wallon and Frédéric Bogard) visited the IP region of ATF2 at KEK for detailed inspection and survey of the location where the new vacuum chamber built by LAL will be installed to house the IP-BPMs provided by KNU. On 19-20 March 2012, a topical ATF2 workshop is taking place at LAL with the entire IP-BPM collaboration (KEK, KNU, LAL, Oxford), to focus on the ATF2 goal 2 ("IP beam stabilization by feedback with 1-2 nm precision") and on the status of the external vacuum chamber provided by LAL.</p>
Publica- tions since 2007	<ol style="list-style-type: none">1. Si-Won Jang et al., " Test results on beam position resolution for low-Q IP-BPM at EK-ATF2", Proceedings of IPAC 2011, San Sebastian, Spain, p. 1293-1295 (2011)2. P. Bambade et.al., Phys. Rev. ST-Accelerators and Beams, Present status and first results of the final focus beam line at KEK Accelerator Test Facility (2010)3. Y. Inoue et al., Phys. Rev. ST-Accelerators and Beams, Development of a high-resolution cavity-beam position monitor 11, 062801 (2008)