Title	***Straight Section for Nanofocusing Beam Line***			
Project Requestor	Yong-Chul Chae			
Date	April 9, 2008			
Group Leader(s)	Katherine Harkay			
Machine or Sector Manager	Louis Emery			
Category	Accelerator R&D			
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*This row is filled in automatically on check in to ICMS. See Note [1]

Description:

Start Year (FY)	**FY09**	**Duration (Yr)**	**2/4**

Objectives:

Evaluate feasibility and performance of a nanofocusing beamline at APS. Implement if successful.

Benefit:

Significantly reduce average horizontal beam size at ID.

Risks of Project: See Note [2]

Medium to Low.

Consequences of Not Doing Project: See Note [3]

Users limited to RHB lattice using existing optics.

Cost/Benefit Analysis: See Note [4]

Based on science case.

Description:

Undulator is segmented and focusing elements (quadrupoles) are inserted in between segments. Feasibility of the optics can be studied in an empty APS sector and normal 8-mm ID chamber, where quadrupoles are based on LCLS design (Phase-1). Full implementation requires new, compact quadrupoles and new vacuum chamber w/o antechamber (Phase-2). Preliminary calculations suggest that avg beta_x = 1 m and avg sigma_x < 60 um is achievable (for reference, for the normal lattice, avg sigma_x is 230 um and for RHB, it is 140 um).

See Accelerator Physics Technical Note: Y.-C. Chae, "Straight Section for Nanofocusing Beam Line," ASD/APG/2008-01 (Mar 6, 2008)

Funding Details

Cost: ($K)
Use FY08 dollars.

Year	AIP	Contingency
1		
2		
3		
4		
5		
6		
7		
8		
9		
Total	0	

Contingency may be in dollars or percent. Enter figure for total project contingency.

Effort: (FTE)
The effort portion need not be filled out in detail by March 28

Year	Mechanical Engineer	Electrical Engineer	Physicist	Software Engineer	Tech	Designer	Post Doc	Total
1								0
2								0
3								0
4								0
5								0
6								0
7								0
8								0
9								0

Notes:

[1] **ICMS**. Check in first revision to ICMS as a *New Check In*. Subsequent revisions should be checked in as revisions to that document i.e. C*heck Out* the previous version and C*heck In* the new version. Be sure to complete the *Document Date* field on the check in screen.

[2] **Risk Assessment.** Advise of the potential impact to the facility or operations that may result as a consequence of performing the proposed activity. Example: If the proposed project is undertaken then other systems impacted by the work
include ... (If no assessment is appropriate then enter NA.)

[3] **Consequence Assessment.** Advise of the potential consequences to the facility or to operations if the proposal is not executed. Example: If the proposed project is not undertaken then ____ may happen to the facility. (If no assessment is appropriate then enter NA.)

[4] **Cost Benefit Analysis.** Describe cost efficiencies or value of the risk mitigated by the expenditure. Example: Failure to complete this maintenance project will result in increased total costs to the APS for emergency repairs and this investment of ___ will also result in improved reliability of ____. (If no assessment is appropriate then enter NA.)