Budget Justification

Budget requests by Ohio State University

The overall budget is organized as follows: During the first year OSU will participate in detector runs using $25,000 for this purpose. The detectors from these runs will be purchased in industry. The primary characterization of these samples will be performed at OSU, with UCLA supporting an independent test setup at CERN for cross checks. Detector development is required in order to increase the currently limited diamond size from the single-crystal process. From discussions with companies it is clear that several iterations will be needed to complete this task. Our collaboration therefore have agreed to characterize devices from other runs the companies will perform. This gives us access to more diamond material than we purchase. During the second year OSU will construct additional devices using the best material selected during year 1 which will then be irradiated and tested to complete the program.

As soon as viable detectors are produced, irradiations will start in year 1 under the leadership of UCLA and continue through year 2. The collaboration plans to use the CERN PS 24 GeV proton irradiation facility as the irradiation service is free and a very sophisticated dosimetry service is available there. A backup solution would be provided by the Indiana University Cyclotron Facility with a 200 MeV proton beam. As irradiated scCVD diamonds become available, they will be characterized at OSU and additionally by the UCLA group at CERN.

For metalization, packaging and testing of the diamonds as well as making test fixtures and devices for electrical testing and radiation hardness OSU requests 20 months of total technical support divided 10 months each year ($22,500 + $23,175). M&S requirements at OSU are estimated to be $7,620 and $5,366 to complete this work in the each year. This is required for the construction holders for metalization, replacement of targets, and the construction of hybrids to hold the diamond detectors and their electronics, test facilities, cables, and associated electronic parts for performing electrical tests. For travel needs of OSU personnel, $4,000 is foreseen for international travel in the first year and $2,000 in the second year for trips to CERN for irradiations and test beams. We forsee two domestic meetings during the year, one at OSU and one at UCLA and we request $1,000 for domestic travel each year for this purpose.

Budget requests by UCLA

Funding is requested to support a graduate student full-time over the two year term of the grant. Employee fringe benefits are calculated using standard university tables for this purpose. Included in this category are graduate student fee remissions and health insurance that currently cost $9,324 annually. Graduate student fee remissions and health insurance are not subject to indirect costs. Funding is requested for foreign travel to allow several trips to CERN each year and to support the travel of the graduate student working at CERN for extended periods. We also request $1,000 for domestic travel each year for meetings at OSU. Funding is also needed to upgrade a charge collection measurement system based at CERN to characterize diamonds before test beam campaigns. The requested funds consist of a VME crate, plastic scintillator, PMTs, and computer controlled ISEG VHQ202 power supply. Funding is also requested to acquire a high speed oscilloscope for use in the test beam area at CERN. A modest amount of

funding is needed for miscellaneous supplies and UCLA's telecommunication fee. Facilities and administrative costs are calculated on modified total direct costs using the 26% off-campus rate since most of the graduate student's time will be at CERN.

The two-year budget request is summarized in Table 2.

Table 2: The total budget request for this project.

Year	Item	Total	OSU	UCLA
Year 1		180K	90K	90K
	scCVD Detectors	25K	25K	
	CCD/test beam equipment	24K		24K
	technician (10 mo.)	31K	31K	
	Ph.D. student	38K		38K
	travel	20K	5K	15K
	other direct costs	9K	7.5K	1.5K
	indirect costs	33K	21.5K	11.5K
Year 2		120K	60K	60K
	technician (10 mo.)	31.5K	31.5K	
	Ph.D. student	38K		38K
	travel	13K	3K	10K
	other direct costs	7.5K	5.5K	2K
	indirect costs	30K	20K	10K