



CARAT

Advanced Diamond Detectors

Integrated Infrastructure Initiative HadronPhysics2, WP15

Time Period: 1. 1. 2009 – 31. 12. 2011

□ THE OBJECTIVES

- Investigation of advanced CVD-diamond materials
- Detector applications in Hadron Physics research

□ FOCUS

Diamond-on-Iridium (DoI) sensors and suitable FEE !!

□ THE DELIVERABLES

- Freestanding DoI samples \Rightarrow 20 x 20 mm² area
- DoI pad detectors assemblies \Rightarrow single-channel readout
- Homogeneity of DoI response \Rightarrow 20 x 20 mm² area prototypes
probing 'Diamond PADI'

PARTICIPANTS

Institutions	19
European	17*
African	1
American	1

* from 8 countries;

Contractors	7
(receiving funds:	4)
Other inv. Inst.	12

RESPONSIBILITIES

- DoI growth and post processing, crystal characterization ⇒ P. 11
- DoI electrical characterization, sensors, beam tests, FEE ⇒ P. 9, 45, 51
- Coordination ⇒ P. 9

Work package number	15	Start date		
Activity Type	RTD			
Work package acronym	CARAT			
Work package title	Advanced Diamond Detectors			
Participant number	Organization legal name	Short name	Activity leaders (in <i>bold the spokesperson</i>)	Person-months (total)
9	Gesellschaft für Schwerionenforschung mbH	GSI	Eléni Berdermann	25
1	Istituto Nazionale di Fisica Nucleare <i>INFN Sezione di Roma 2</i>	INFN <i>INFN-RM2</i>	<i>Gianluca Verona-Rinati</i>	6 6
6	Stiftung Deutsches Elektronen-Synchrotron	DESY	Wolfgang Lohmann	30
11	Universität Augsburg	UA	Matthias Schreck	18
19	Ruprecht-Karls-Universität Heidelberg	UHEI	Annemarie Pucci	10
45	Institutul National de Cercetare-Dezvoltare pentru Fizica si Inginerie Nucleara – Horia Hulubei	IFIN-HH	Mihai Petrovici	8
51	University of Glasgow	UGlasgow	Val O' Shea	4
Other involved institutions			Activity leaders	Person-months
VERA Lab, Vienna (Austria)			Robin Golser	4
Hasylab, Hamburg (Germany)			Heinz Graafsma	7
University of Karlsruhe (Germany)			Wim de Boer	4
CEA – Direction de la Recherche Technologique (France)			Philippe Bergonzo	10
University of Prague (Czechia)			Milos Nesladek	4
ESRF, Grenoble (France)			John Morse	20
Università e Sezione INFN di Milano (Italy)			Alberto Pullia	6
Fraunhofer Institut für Angewandte Festkörperforschung (Germany)			Christoph Nebel	2
Kurchatov Institute, Moscow (Russia)			Vitaly Liechtenstein	4
University of Surrey (United Kingdom)			Paul Sellin	12
Michigan State University, East Lansing (USA)			Andreas Stolz	4
University of the Witwatersrand, Johannesburg (South Africa)			Simon H. Connell	20

DESCRIPTION of WORK

Work package number	WPI5
Activity type	RTD
Work package acronym	CARAT
Work package title	<i>Advanced Diamond Detectors</i>

TASKS/Subtasks	2009				2010				2011				2012			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. ENGINEERING DIA-ON-IR SAMPLES																
1.1 Preparation & struct. charact. of 1cm ² samples	█	█	█	█												
1.2 Preparation & struct. charact. of 2cm ² samples			█	█	█	█	█									
2. METALLIZATION																
2.1 Pad motifs on 1x1cm ² samples	█	█	█	█												
2.2 Strip-metallization of 2x2cm ² with existing masks					█	█	█									
3. DIA-ON-IR DETECTOR PROPERTIES																
3.1 IV characteristics, TCT measurements, CCE	█	█	█	█	█	█	█									
3.3 1cm ² pad detectors: energy- and time resolution	█	█	█	█	█	█	█	█	█							
3.4 Strip detectors 2cm x 2cm: spatial homogeneity							█	█	█	█	█	█				
Milestones																
1	1cm x 1cm test samples ready				5				Detector characterization in laboratory completed							
2	2cm x 2cm test samples ready				6				Spectroscopy- and timing properties evaluated							
3	Pad motifs realized				7				Spatial homogeneity characterized							
4	Strip metallization completed															

BUDGET ⇒ 2009 - 2011

WP15: CARAT								
REQUESTED EC CONTRIBUTION PER BUDGETARY ITEM AND PER BENEFICIARY								
Contr. No	Contractor Acronym	Personnel (EUR)	Consumables (EUR)	Travel and workshops (EUR)	Total direct costs (EUR)	Indirect costs (EUR)	Requested EC contribution (EUR)	OVERHEAD
9	GSI	0	7 000	5 000	12 000	0	12 000	20.00% ON personnel
11	UA	55 000	0	0	55 000	33 000	88 000	60.00%
45	IFIN-HH	0	8 333	0	8 333	1 667	10 000	20.00%
51	UGlasgow	0	6 250	0	6 250	3 750	10 000	60.00%
	TOTAL	55 000	21 583	5 000	81 583	38 417	120 000	

WP15: CARAT								
COMPLEMENTING RESOURCES PER BUDGETARY ITEM AND PER BENEFICIARY								
Contr. No	Contractor Acronym	Personnel (EUR)	Consumables (EUR)	Travel and workshops (EUR)	Total direct costs (EUR)	Indirect costs (EUR)	Total complementing resources (EUR)	
9	GSI	25 000	1 750	0	26 750	5 000	31 750	20.00% On personnel
11	UA	19 000	0	0	19 000	11 400	30 400	60.00%
45	IFIN-HH	27 000	6 333	0	33 333	6 667	40 000	20.00%
51	UGlasgow	0	2 083	0	2 083	1 250	3 333	60.00%
	TOTAL	71 000	10 166	0	81 166	24 316	105 482	

WP15: CARAT						
INDICATIVE TOTAL COSTS AND INDICATIVE REQUESTED EC CONTRIBUTION PER BUDGETARY ITEM						
	Personnel (EUR)	Consumables (EUR)	Travel and workshops (EUR)	Total direct costs (EUR)	Indirect costs (EUR)	Total costs (EUR)
REQUESTED EC CONTRIBUTION	55 000	21 583	5 000	81 583	38 417	120 000
COMPLEMENTING RESOURCES	71 000	10 166	0	81 166	24 316	105 482
TOTAL BUDGET	126 000	31 749	5 000	162 749	62 733	225 482