

COLLABORATION AGREEMENT

IN2P3 - COPIN

I. Identification of the laboratories

Partner	COPIN
IN2P3 laboratories	
Partner laboratories	Varsovie (HIL)

II. Identification of the collaboration

Title of the collaboration	Spectroscopie gamma de noyaux N-Z
Number of the collaboration	06-122
IN2P3 spokesperson	G. de FRANCE
COPIN spokesperson	M. PALACZ
Scientific Domain	Nuclear Physics

Status of the collaboration

Status	The renewal of the collaboration is requested for the period January 1st - December 31st, 2023
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III. Status report for the period January 1st to December 31st, 2022

III.1 IN2P3 scientists in COPIN

Total time approved for 2022	5
Total time used for 2022	0
List of scientists	

III.2 COPIN scientists in France

Total time approved for 2022	10
Total time used for 2022	9
List of scientists	1. M. Palacz (5 days) 2. G. Jaworski (4 days)

III.3 Scientific results of the above-mentioned collaboration

Description	
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In 2022 our activities concentrated on the preparations of a campaign of experiments in which the NEDA detectors will be employed together with the EAGLE gamma-ray spectrometer at HIL, Warsaw. The Neutron Detection Array (NEDA) was constructed by an international collaboration over the years 2007–2018. In 2018 NEDA was employed in a series of experiments at GANIL, in connection to AGATA. In December 2021, NEDA was

transported to HIL. Work on the adaptation of the HIL environment to NEDA started in January 2022. In the period July-September 2022, the mechanics of the EAGLE frame was appropriately modified and 52 NEDA detectors were installed in forward part of it. This aggregate of neutron detectors will be used together with 15 HPGe situated at backward angles. Work on the preparation of the EAGLE-NEDA array (nicknamed NEEDLE) is in progress at the time of writing this report (October 2022). In particular, a new at HIL data acquisition system based on CAEN V1725 digitizers is set up.

In April 2022, an extended in-beam commissioning and three experiments employing NEEDLE were accepted by the HIL PAC.

In parallel to the work on the NEEDLE array, we continue analysis of the data acquired in 2018 with the AGATA-NEDA setup at GANIL.

IV. Renewal of the collaboration for 2023

IV.1 Proposed scientific program

Description

In 2023 the accepted NEEDLE experiments should be run. One of these experiments, in addition to EAGLE and NEDA detectors requires installation of the DIAMANT charged particle array. In this experiment, proposed by M.Palacz et al. , excited states in ^{57}Cu will be studied with the aim to acquire new information on single proton-particle levels and core softness at $N=Z=28$. The installation of DIAMANT requires integration of the NUMEXO2 digitizers with EAGLE-NEDA DAQ system.

The French participants will take part in the experimental activities in Warsaw. Visits of Polish participants to France will also be required, in particular to acquire knowledge which is necessary to install DIAMANT and its digitizers in Warsaw.

IV.2 Estimated duration for IN2P3 scientists in COPIN

Total time requested for 2023	7
List of scientists	1. G. de FRANCE (7 days)

IV.3 Estimated duration for COPIN scientists in France

Total time requested for 2023	10
List of scientists	1. M. PALACZ (5 days) 2. G. JAWORSKI (5 days)