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ELIADE gamma ray spectrometer for NRF Experiments at ELI-NP

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The laser based facility, Extreme Light Infrastructure - Nuclear Physics (ELI-NP), will benefit gamma beams produced via the Inverse Compton Scattering. Thus, the gamma beam delivered to users at high intensity and very narrow bandwidths. It opens unique opportunity to study the nuclear electromagnetic response below and above the particle separation energy. The ELIADE gamma-ray spectrometer will advance the nuclear structure studies using the Nuclear Resonance Fluorescence (NRF) method to derive new information on various effects manifested below such as the collective magnetic dipole Scissors Mode in deformed nuclei, quadrupole excitations with mixed proton-neutron symmetry, the electric Pygmy Dipole Resonance, octupole coupled excitation etc. A sound range of industrial, homeland security and healthcare applications based on NRF nuclear excitation will be also hosted at ELIADE. The ELIADE array, as it will be discussed in the talk, consists of 8 segmented Clover detectors arranged in two rings (90 and 135 degree in respect to the beam direction) around the target position. The possible day-one (day-two, etc) experiments at ELIADE using mono energetic gamma beams are presented in the second part of the talk.

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