Abstract.

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Title: **CYCLADS, an EU FET proposal for high power cyclotron conceptual design**
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It will be presented a recently submitted proposal to Horizon 2020 call FETOPEN. FET-OPEN means Future Emerging Technology, novel ideas for radically new technologies. The proposal presented, named CYCLADS, aims at designing a novel High Power Cyclotron (HPCy) as part of Accelerator Driven Systems (ADS) for innovative nuclear waste transmutation applications.

The presentation focuses on the general FET requirements and how the CYCLADS project fits these requirements. Then the project targeted breakthrough and the proposed innovative aspects are presented followed by the expected impacts on society, and the way the formed Consortia will implement the project if successfully evaluated. It is described CYCLADS ambition to combine latest advances in accelerator expertise, innovative ideas on nuclear Science & Technology and developments of HTS materials, to generate a transformative impact to EU economy and society. ADS can be a possible and effective method for incinerating the long lived component of the nuclear waste that pose longer-term radiological risks. To date no widely acceptable solution is at hand despite the technical maturity of geological disposal options. Thus, ADS may contribute to resolving the radioactive waste issue, which continues to be a major concern, because of the increasing inventory of spent nuclear fuel and the persistent public opposition to geological repositories. A special focus is devoted on the advantages of the unprecedented Single-Stage cyclotron in the MW power class proposed in CYCLADS over the current accelerators proposed for ADS. The ambition is to change the technical-economic equation for ADS alleviating most of the cost drivers identified in previous ADS designs, making it virtually adoptable by the market. The multidisciplinary group of European experts in key technological areas of accelerator, target and subcritical system, forming the Consortium is presented. The possible impact of CYCLADS on different sectors than the nuclear waste incineration is as well described, e.g. neutrino physics, isotopes production and nuclear industry, multiplying the societal and economic values of the project.