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Status of the Cyclotron Driven LARAMED Project at INFN Legnaro National Laboratories

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LARAMED (acronym for LAboratory of RADionuclides for MEDicine) is a research facility, currently under completion at Legnaro National Laboratories (INFN-LNL), equipped with one of the few high-energy (70 MeV), high-current (750 μ A max, dual exit) proton cyclotron currently installed worldwide [1]. LARAMED project has been conceived, since the beginning, to meet a double scientific and technological goal. To explore, first, alternative routes for a more efficient production of radionuclides (RNs) playing already a key role in nuclear medicine (NM), as well as to uncover new routes for producing novel RNs having potential interest for medical applications. Ultimately, the main scope of this project is to establish a facility at LNL for producing medical RNs with the characteristics necessary to ensure their use in clinical practice.

LARAMED has been planned with a dedicated high intensity beamline, as well as with a dedicated, low-current, beamline for nuclear cross section determination useful for evaluating new routes for RNs production, e.g., the theranostic ones. A key activity in LARAMED will be also devoted to the development of advanced technologies for assembling high-power targets capable of sustaining and dissipating intense heat loads. A significant number of RNs is expected to be produced at LARAMED, such as, e.g., $^{64}/^{67}\text{Cu}$, $^{44}/^{47}\text{Sc}$, ^{155}Tb .

An overview about the facility status and the parallel research programs carried out by the LARAMED research group in the last years is the purpose of this presentation.