^{18}Ne Diproton decay

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The search of di-proton decay is one of the challenging fields opened by the availability of radioactive beams. Recently such decay has been observed for ^{45}Fe[1] at the ground state, and investigations [2,3] on ^{18}Ne excited states suggest that the 6.15(1^-) MeV level could be a good candidate to a two-proton emission. In the present experiment we used a tagged ^{18}Ne beam selected among the fragmentation products of a primary ^{20}Ne at 45 A MeV and 300 enA of current on a ^{9}Be 500 μm thick production target by using the FRIBS set-up [4]. Figure 1 (right) shows the identification of the ^{18}Ne in the ΔE-ToF plot obtained from the Si-Strip tag detector signal vs the RF one. Reaction products were detected by

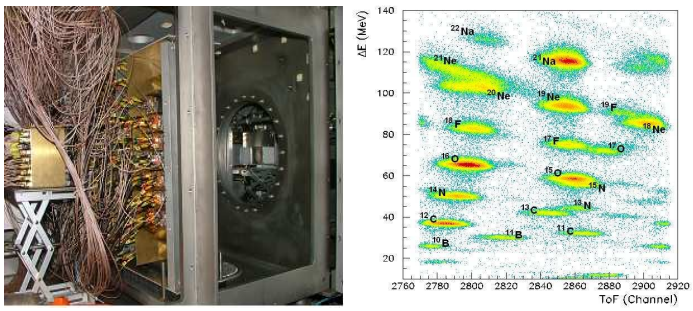

Figure 1: *Left: Experimental apparatus, right: ΔE-ToF plot of the Si-Strip signal vs the RF one.*

two Hodoscope covering the forward hemisphere from 0° to 35° polar angles (Fig.1 (left)). We expect to populate the 6.15(1^-) MeV level through the E1 Coulomb excitation of the ^{18}Ne projectile on a ^{208}Pb target.

Figure 2 shows preliminary CM excitation energy spectra of the two selected decay channels ^{17}F+p

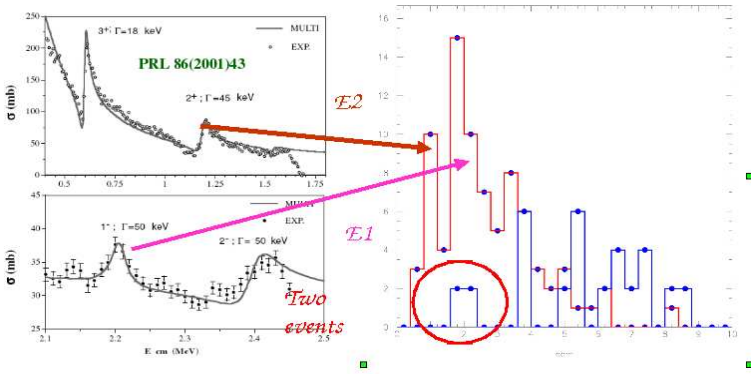

Figure 2: *Left: Excitation energy of the ^{17}F+p reaction of Ref [2]. Right: same for the ^{17}F+p (red) and ^{16}O+2p (blue) decays from ^{18}Ne excited states.*

and ^{16}O+2p. In spite of the poor statistics a two proton decay from the 6.15(1^-) MeV level is observed together with others higher energies decays.

Present results and perspective on how to disentangle ^{2}He decay from two proton uncorrelated emission will be presented.

[1] J.Giovinazzo et al Phys. Rev. Lett. 89(2002)102501; B.Blank et al C.R. Physique (2003)4
[2] J.Gomez del Campo et al; Phys.Rev.Lett 86(2001)43
[3] T.Zerguerras; Orsay - PhD thesis
[4] E.Rapisarda et al.,this Conference.