

## STRONG RESONANCES AT HIGH EXCITATION ENERGY IN $^{17}\text{O} + \text{ALPHA}$ RESONANCE SCATTERING

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Recently, first measurements of  $^{17}\text{O} + \text{alpha}$  resonance scattering were performed in Nur-Sultan [1]. These measurements revealed a very strong group of the states in the vicinity of a high energy limit of data [1]. These resonances could not be analyzed because they were too close to the edge of the spectrum. Therefore we performed new measurements at higher energy of  $^{17}\text{O}$  beam at 54.4 MeV using the TTIK method at the INFN-LNS tandem. An array of four single Si detectors of 500  $\mu\text{m}$  thickness and one  $\Delta E-E$  telescope of Si detectors (75 and 1080  $\mu\text{m}$ ) were placed at the back of two meter diameter chamber to detect light recoils at different angles including  $0^\circ$  (laboratory system) in steps of  $5^\circ$ . The  $\Delta E-E$  telescope was needed to evaluate the contribution of protons to charge particle spectra. At present, the most interesting result of this work is an observation of very strong resonances at high excitation energies of 16 MeV. At this excitation energy the density of states in  $^{21}\text{Ne}$  is well over 100 levels per 1 MeV. These resonances are also over 10 MeV above the neutron decay threshold. It is not evident, how to obtain additional information about these remarkable resonances. For instance, their observation is practically impossible in a simple  $^{20}\text{Ne}(n,p)$  reaction. The data are analyzed in the framework of  $R$ -matrix approach.

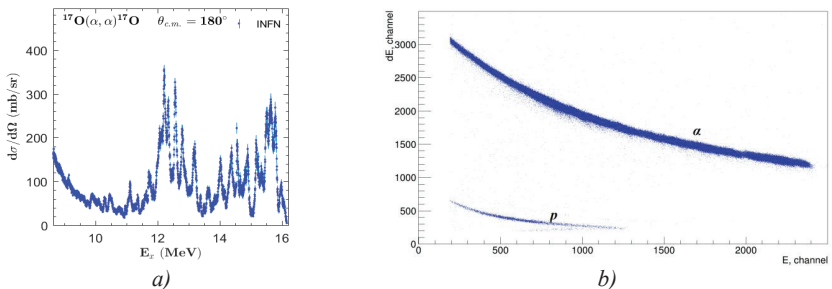


Fig. 1. a) Excitation function for the  $^{17}\text{O}(\alpha, \alpha)^{17}\text{O}$  elastic scattering at  $180^\circ$  degree from INFN-LNS Tandem. b)  $dE-E$  spectrum of  $^{17}\text{O} + ^4\text{He}$  interaction.