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# Investigation of reaction channels in the production of alpha particles in light system

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#### Introduction



- Low energy reactions induced by exotic neutron halo projectiles such as <sup>6</sup>He have been investigated over the last years.
- The particle identification spectra of those experiments present a high yield of  $\alpha$ -particles produced in the collisions induced by <sup>6</sup>He.
- Experimental data from Ref [3] was analysed in order to obtain the energy and angular distribution for the α-particles yield.

## **Experimental Setup**

- Pelletron Particle Accelerator <sup>[1]</sup>
- RIBRAS system <sup>[2]</sup>
  - Telescope detection system
  - In-Flight Separation (IFS)
- Data already available (RIBRAS, 2008)
  - <sup>6</sup>He+<sup>9</sup>Be, E<sub>lab</sub>= 16.2MeV
  - <sup>7</sup>Li primary beam
  - <sup>9</sup>Be(<sup>7</sup>Li,<sup>6</sup>He)<sup>10</sup>B production reaction





### **Biparametric Spectra**

- <sup>7</sup>Li, <sup>6</sup>He and <sup>4</sup>He elastic scattering peaks
- <sup>4</sup>He yield is present only in <sup>9</sup>Be spectra:

- <sup>6</sup>He yield is present only in <sup>9</sup>Be spectra:
  <sup>9</sup>Be(<sup>7</sup>Li, <sup>6</sup>He)<sup>10</sup>B
- <sup>8</sup>Li peak is present only at <sup>9</sup>Be front angles:
  <sup>9</sup>Be(<sup>7</sup>Li, <sup>8</sup>Li)<sup>8</sup>Be





### Results

The α-particles energy distribution



#### References

[1] R. Lichtenthäler et al. Eur. Jour. of Phys., 25, 733, 2005. [2] A. Lépine-Szily et al. Nuclear Physics News, v. 23, p. 5-11, 2013. [3] K. C. C. Pires et al, Phys. Rev. C83, 064603, 2011. [4] Jin Lei, A. M. Moro. Phys. Rev. C92, 044616 (2015). [5] O.C.B. Santos et al, Phys. Rev. C103, 064601 (2021). [6] G. Gregoire, Phys. Lett., v8, 5, 1964, 328-330.