

**Zeitschrift:** Helvetica Physica Acta  
**Band:** 34 (1961)  
**Heft:** [6]: Supplementum 6. Proceedings of the International Symposium on polarization phenomena of nucleons

**Artikel:** The reaction Li<sub>7</sub>(p,) with polarized protons  
**Autor:** Weddigen, C. / Schopper, H.  
**DOI:** <https://doi.org/10.5169/seals-513283>

#### Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

#### Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

#### Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

**Download PDF:** 08.08.2025

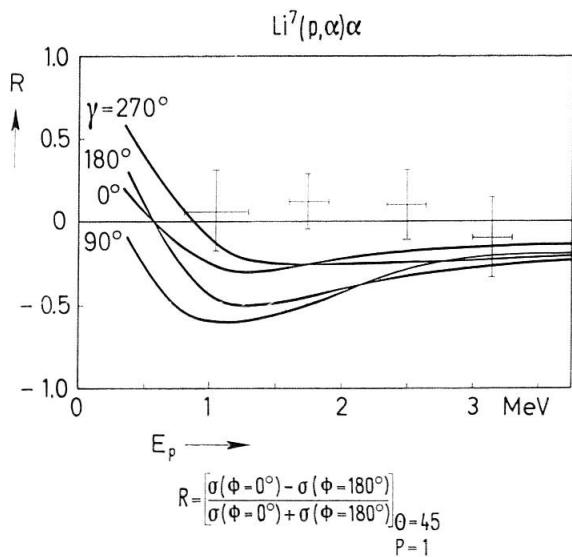
**ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>**

## The Reaction $\text{Li}^7(p,\alpha)\alpha$ with Polarized Protons

By C. WEDDIGEN and H. SCHOPPER, University of Mainz

If this reaction is induced by polarized protons one expects a right-left asymmetry for the  $\alpha$ -particles emitted in the break up of the  $\text{Be}^8$ -compound state. Polarized protons were produced by the  $\text{C}^{12}(d,\phi)$ -stripping reaction ( $E_d = 1.06$  MeV). The proton polarization has been measured by JURIĆ and ĆIVILOV [1]<sup>1</sup>) and is  $P = 0.35 \pm 0.12$  for  $\theta = 52^\circ$ .

Measurements for various proton energies were performed by slowing down the protons in Al-absorbers. An enriched  $\text{Li}^7$ -target was used. The  $\alpha$ -particles were detected in nuclear emulsions. The experimental results for the relative asymmetry  $R$  are shown in the figure. Within the statistical errors no asymmetry was found.



WOLFENSTEIN [2] calculated  $R$  using a set of parameters which were deduced from the angular distribution assuming an interference of a very broad resonance with  $J = 0$  and a narrow one with  $J = 2$ . The disagreement of these calculations (curves in the figure) with the measurements is

<sup>1)</sup> Numbers in brackets refer to References, page 340.

not surprising as the parameters could not be determined uniquely from the angular distribution alone. The absence of an asymmetry could be understood by assuming that the ( $J = 2$ )-level is formed by protons with a total angular momentum  $j = 1 + s = 3/2$  but not by protons with  $j = 1/2$ .

However the disagreement of our results with those of TANNER communicated in the preceding report could be due to a vanishing proton polarization. The deuteron energy in the work of JURIĆ and ĆIRILOV was not known accurately (private communication) and the proton polarization might change rapidly with this energy. The determination of the proton polarization as a function of the deuteron energy is in progress.

*Note added in proof:* For the proton polarization a preliminary value of  $0.23 \pm 0.03$  was found for  $E_d = 1.06$  MeV. The polarization decreases rapidly for lower and higher deuteron energies.

#### REFERENCES

- [1] JURIĆ and ĆIRILOV, C. r. du Congr. Int. de Phys. Nucl., Paris 1958.
- [2] WOLFENSTEIN, Phys. Rev. 75, 1664 (1949).