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HELVETICA PHYSICA ACTA

Zusammenfassungen der letzten eingegangenen Arbeiten

Résumés des derniers articles reçus

Distinguished Self-adjoint Extension for Dirac Operator with Potential Dominated by Multicenter Coulomb Potentials

by G. NENCIU

Institut of Atomic Physics, Bucharest, Romania

(20. V. 1976)

Abstract. The existence and the uniqueness of the distinguished self-adjoint extension of the Dirac operator describing an electron in the field of a finite number of point charges with $Z < 137$ is proved.

Bremsstrahlung and Čerenkov Radiation of High Energy Particles in an Excited Medium

by S. P. ANDREIEV¹⁾

Département de Physique Théorique, Université de Genève, CH-1211 GENEVE 4 – Switzerland

(21. V. 1976)

Abstract. Bremsstrahlung and Čerenkov radiation of a high energy particle in a homogeneous medium excited by a resonant electromagnetic field are investigated. It is shown that the field greatly influences the radiation by the particle moving in the medium. The field leads to a suppression of Čerenkov radiation. In some cases the presence of the field leads to an increase of Bremsstrahlung. The intensities of both Bremsstrahlung and Čerenkov radiation are shown to depend non-linearly on the intensity of the field.

Bestimmung der spektroskopischen Faktoren mehrerer Energieniveaux der Isotope $\text{Ni}^{59,61,63,65}$ mit (d, p) – Reaktionen bei 2,8 MeV Deuteronenenergie

VON P. STAUB, E. BAUMGARTNER, J. X. SALADIN,¹⁾ H. SCHÄR und D. TRAUTMANN

Institut für Physik der Universität Basel

(24. V. 1976)

Abstract. The differential cross section of $\text{Ni}^{58}(d, p)\text{Ni}^{59}$, $\text{Ni}^{60}(d, p)\text{Ni}^{61}$, $\text{Ni}^{62}(d, p)\text{Ni}^{63}$ and $\text{Ni}^{64}(d, p)\text{Ni}^{65}$ to different excitation states of the final nuclei have been measured at a deuteron energy of 2.8 MeV at angles between 50 and 160 degrees. The experimental differential cross sections were compared with theoretical curves. The spectroscopic factors for 76 different states of the product nuclides were determined.

Untersuchungen zur Bildung von Tracks in Kristallen

von A. SIGRIST und R. BALZER

Laboratorium für Kernphysik, ETH, 8093 Zürich

(28. V. 1976)

Abstract. The minimal energy loss $(dE/d\xi)_k$ [$\text{MeV} \cdot \text{cm}^2 \cdot \text{mg}^{-1}$] for the formation of a track in an insulator has been determined for mica, tourmaline, quartz glass, quartz crystal, lithium niobate and beryl. The investigations show that the $(dE/d\xi)_k$ -value of a track detector can be roughly estimated from the thermal conductivity of the given material.

Modèle Semiphénoménologique de l'Interaction Nucléon – Nucléon

par A. HOURIET et X. BAGNOUD

Institut de Physique Théorique, Université de Fribourg

(2. VI. 1976)

Abstract. A nucleon with isobars is used to elaborate a model of the nucleon–nucleon interaction at low energy ($E_{\text{CM}} < 160 \text{ MeV}$). Three free parameters only are introduced among which f_r^2 , the pion-nucleon renormalized coupling constant. The model establishes a very good coordination for deuteron and p – p scattering-polarization measurements ($^1\text{K}_0$, $^1\text{D}_2$, $^1\text{G}_4$ phase shifts), and permits the determination of f_r^2 for every independent experimental value. For 21 such values, we obtain the mean value $\langle f_r^2 \rangle = 0.0785$ with $\Delta f_r^2 = 0.0024$ (3%).

Bestimmung spektroskopischer Faktoren für Energieniveaus der Isotope $^{41, 43, 45, 49}\text{Ca}$ mit (d,p) – Reaktionen bei 2,5 MeV Deuteronenenergie

von H. SCHÄR, D. TRAUTMANN und E. BAUMGARTNER

(Institut für Physik der Universität Basel)

(2. VI. 1976)

Abstract. Differential (d, p) -cross sections on ^{40}Ca , ^{42}Ca , ^{44}Ca , ^{48}Ca at 2.5 MeV incident deuteron energy are measured in 5 degree intervals between 40 and 160 degrees. The angular distributions are compared with distorted-wave Born approximation calculations, and the spectroscopic factors are extracted for a number of transitions.

Spin Corrections to the Two-Body Eikonal Amplitude¹⁾

by M. QUIROS²⁾

University of Geneva

(22. VI. 1976)

Abstract. Using the one-parameter eikonal representation and α -space techniques developed in an earlier paper, the first-order spin corrections are obtained and its high-energy behaviour proved to be non-negligible. In the limit where the range of interaction goes to infinity, bound-states, in the electron positron annihilation region, appear as poles in the s -channel and Regge trajectories in the t -channel, as in the usual eikonal model. Spin corrections are associated with double poles.

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