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Neu eingegangene Arbeiten

H. Genz, R. E. Wood, J. M. Palms, and P. Venugopala Rao, Emory University, Atlanta, Georgia 30322:

K-Electron Capture Probabilities in the Decays of Gd¹⁵¹ and Dy¹⁵⁹

The *K*-electron capture probability, P_K , in the allowed and non-unique first-forbidden transitions is measured by observing coincidences between *K* x rays and γ rays. The following results are obtained. In Gd¹⁵¹ decay P_K to the 349.8 keV level is 0.713 ± 0.015 and P_K to the 307.4 keV level is 0.813 ± 0.020 . It is also deduced that the decay energy Q_{EC} is 491 ± 1.4 keV and the spin of the 307.4 keV level is $7/2$. In Dy¹⁵⁹ decay P_K to the 58.0 keV level is found to be 0.803 ± 0.032 .

N. S. Craigie, II. Institut für Theoretische Physik der Universität Hamburg,
A. B. Kraemmer and **K. D. Rothe**, Institut für Theoretische Physik der Universität Heidelberg:

Are there AFS Type Enhancements in e^+e^- Annihilation

It is shown that the usual Regge mechanism of building up the leading behaviour of $\sigma_{\tau 0\tau}$ by summing a power series in logs is absent in the case of a multiperipheral loop topology.

G. Venus, Max-Planck-Institut für Plasmaphysik, Garching bei München:
Elektronendichteverlauf in magnetisierten Wasserstoffbögen bei Abweichung der Ionentemperatur von der Elektronentemperatur (Electron Density Distribution in Magnetized Hydrogen Arc Plasmas with the Ion Temperature Deviating from the Electron Temperature)

The radial distribution of the electron density $n_e(r)$ ($n_e = \text{approx. } 10^{16} \text{ cm}^{-3}$) in hydrogen arc plasmas in a strong axial magnetic field is determined by measuring the rotation of the polarization plane of linearly polarized light (Faraday effect). As expected, it is found that the electron density decreases towards the discharge axis, i.e. with increasing temperature, but again rises near the axis. This increase is due to a thermomagnetic effect, the Nernst effect, in cases where the ion temperature is much lower than the electron temperature.

P. H. Dederichs and **R. Zeller**, Institut für Festkörperforschung der Kernforschungsanlage Jülich:

Variational Treatment of the Elastic Constants of Disordered Materials

Using the method of Hill a variational principle is derived to obtain upper and lower bounds for the effective elastic constants of disordered materials, such as polycrystals or multiphase materials. All bounds previously known are rederived and especially new bounds are given being closer than the ones of Hashin and Shtrikman. In detail the elastic constants of polycrystals built of cubic single crystals and of multiphase materials are considered. The analogous bounds for the dielectric constant of polycrystals are also given.

H. Falke, H. P. Jablonski, J. Kästner, and E. F. Wassermann, 2. Physikalisches Institut der Rheinisch-Westfälischen Technischen Hochschule, Aachen, Germany: Transition Temperature Depression in Quench Condensed ZnMn Dilute Alloy Films

The depression of the superconducting transition temperature has been investigated for *uhv* quench condensed ZnMn alloy films, containing 5–50 ppm Mn. Within accuracy limits the result for the initial depression $dT_c/dc = 285 \pm 30$ K/at % is in agreement with the bulk material value of 305 K/at %, supporting the equivalence between quench condensed films and bulk material alloys. A detailed analysis of the data within the framework of the Zittartz-Müller-Hartmann theory shows, that for the “Kondo-system” ZnMn (with $T_k/T_{c0} \approx 1$ and $S = 3/2$) the thin film results follow the theoretical T_c depression curve better than the bulk material values. This is due to the early onset of impurity-impurity interactions in the bulk alloys, which are reduced in quenched films because of reduced mean free path of the conduction electrons.

R. Sturm, F. W. Theile, R. Thielmann, E. Grünberg und M. Scholz, Fachbereich Physik der Philipps-Universität Marburg: Kernspektroskopische Untersuchungen am Zerfall des ^{115m}Cd (Nuclear Spectroscopic Investigations in the Decay of ^{115m}Cd)

The energy levels in ^{115}In at 934, 1133, 1291, and 1419 keV weakly populated by β^- -decay from ^{115m}Cd have been studied by angular correlation measurements using NaJ(Tl)-detectors. The previously measured angular correlations of the (485–934) keV cascade—which is practically isotropic—and the (158–1133) keV cascade were remeasured with higher accuracy. A 286 keV transition between the 1419 and the 1133 keV energy levels was observed and the highly anisotropic angular correlation of the (286–1133) keV cascade was also measured.