



ELSEVIER

Nuclear Physics A654 (1999) 531c-534c

NUCLEAR
PHYSICS A

www.elsevier.nl/locate/npe

Beam asymmetry Σ in meson photo-production at GRAAL

J. Ajaka^a, V. Bellini^b, J.P. Bocquet^c, M. Capogni^a, M. Castoldi^d, A. D'Angelo^e, J.P. Didelez^a, R. Di Salvo^a, M.A. Duval^a, C. Gaulard^f, F. Ghio^g, B. Girolami^g, M. Guidal^a, E. Hourany^a, A. Lapik^h, I. Kilvingtonⁱ, V. Kouznetsov^h, P. Levi Sandri^f, A. Lleres^c, D. Moricciani^{e,*}, V. Nedorezov^h, L. Nicoletti^e, C. Perrin^c, D. Rebreyend^c, F. Renard^c, C. Schaerf^e, A. Turinge^j, A. Zucchiatti^d

^aIN2P3 Institut de Physique Nucléaire d'Orsay, France

^bINFN Laboratori Nazionali del Sud and Università di Catania, Italy

^cIN2P3 Institut des Sciences Nucléaires de Grenoble, France

^dINFN Sezione di Genova and Università di Genova, Italy

^eINFN Sezione di Roma 2 and Università di Tor Vergata, Italy

^fINFN Laboratori Nazionali di Frascati, Italy

^gINFN Sezione Sanità and Istituto Superiore di Sanità, Roma, Italy

^hInstitute for Nuclear Research, RU-117312 Moscow, Russia

ⁱEuropean Synchrotron Radiation Facility, F-38026 Grenoble, France

^jI. Kurchatov Institute of Atomic Energy, RU-123182 Moscow, Russia

Photon beam polarisation asymmetries for the photo-production on the proton of π^0 , π^+ and η have been measured in the energy region 550-1100 MeV using the linearly polarised GRAAL photon beam.

The structure of the nucleon gives a very rich spectrum of excited states, many of which have been associated with the baryon resonances observed in π - N scattering. In the photoproduction of pseudoscalar mesons π and η on the nucleon, complementary study of the baryon resonances can be carried especially when a linearly polarised photon beam is used. It is well known that the beam asymmetry Σ is sensitive to the weakly excited resonances through an interference term with the highly excited ones. This is seen in the expressions of the differential cross section and the beam asymmetry in terms of the helicity amplitudes[1-3]:

$$\frac{d\sigma}{d\Omega} \sim |H_1|^2 + |H_2|^2 + |H_3|^2 + |H_4|^2 \quad \text{and} \quad \Sigma \sim \Re(H_1 H_4^* - H_2 H_3^*). \quad (1)$$

*Oral presentation