

CERN LIBRARIES GENEVA



CM P00046460

CERN/SPSC/77-15  
SPSC/P 6/S  
23 02 1977

Expt: NA1

Beam: —

Approved:

Status: preparation

Measurement of the photoproduction of vector and scalar  
bosons Frascati<sup>1</sup> - Milan<sup>2</sup> - Pisa<sup>3</sup> - Rome<sup>4</sup> Collaboration  
(FRAMM)

S R Amendolia<sup>3</sup>, G Bellini<sup>4</sup>, E Bertolucci<sup>3</sup>, G Bologna<sup>1</sup>,  
U Bottigli<sup>3</sup>, C Bradaschia<sup>3</sup>, B D'Ettorre Piazzoli<sup>1</sup>,  
M De Vincenzi<sup>4</sup>, M Di Carato<sup>2</sup>, F L Fabbri, L. Foà<sup>3</sup>,  
A Giazotto<sup>3</sup>, M Giorgi<sup>3</sup>, P F Manfredi<sup>2</sup>, G Mannocchi<sup>1</sup>,  
A Menzione<sup>3</sup>, E Meroni<sup>2</sup>, S Micheletti<sup>2</sup>, L Moroni<sup>2</sup>,  
F Palombo<sup>2</sup>, P Picchi<sup>1</sup>, M Quaglia<sup>3</sup>, P G Rancoita<sup>2</sup>,  
L Ristori<sup>3</sup>, G Rivellini<sup>1</sup>, L Rolandi<sup>3</sup>, S Sala<sup>2</sup>,  
L Satta<sup>1</sup>, A Scribano<sup>3</sup>, M Severi<sup>4</sup>, P Spillantini<sup>1</sup>,  
R Stanga<sup>3</sup>, A Stefanini<sup>3</sup>, G Vegni<sup>2</sup>, M L Vincelli<sup>3</sup>.

~~FRAMM~~

The original program of the experiment consisted of a detailed study of projectile fragmentation on nucleons and nuclei with particular attention to diffractive excitation. This program of research has now been specified as the measurement of forward photoproduction on nuclei (coherent) and nucleons (diffractive) up to  $\sim 180$  GeV, aiming at the following results

- i) measurement of the  $\eta'$  lifetime via Primakoff effect
- ii) search for an  $\eta_c$  signal in the mass spectrum for a possible measurement of its lifetime
- iii) study of the spectroscopy of the new massive particles, with particular attention to the hadronic decay channels, containing charged particles and photons, and to radiative decays

The apparatus consists of a forward spectrometer for charged particles and photons and of a large angle detector which provides the topology of individual events. The spectrometer subtends a solid angle of  $\sim 40$  msr and consists of four bending magnets interspaced by sets of drift chambers, counter hodoscopes and photon detectors. The momentum resolution for charged particles is  $\pm 0.5\%$  almost independent of the particle momentum. Photon detectors ~~are constituted by~~ <sup>consist of</sup> lead-scintillation counter hodoscope sandwiches  $\left(\frac{\Delta E_\gamma}{E_\gamma} \approx \frac{0.4}{\sqrt{E_\gamma(\text{GeV})}}\right)$  or lead-glass arrays  $\left(\frac{\Delta E_\gamma}{E_\gamma} \approx \frac{0.1}{\sqrt{E_\gamma(\text{GeV})}}\right)$ , depending on their dimensions. The spatial resolution of these detectors is  $\delta = \pm 1.5$  mm. The large angle detector, consisting of proportional chambers, drift chambers and scintillation counters, measures the angle of charged particles and photons produced outside the spectrometer. Detectors around the target guarantee that events on nuclear target are of coherent nature.