INVESTIGATION OF P-RESONANCE PROPERTIES IN SLOW NEUTRON FISSION OF ^{235}U

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Using a pulse neutron beam of the time-of-flight spectrometer GNEIS /1/ the P-even forward-backward asymmetry of light fission fragments have been measured to get first information about p-resonance properties in compound nucleus ^{236}U.

The asymmetry and the neutron energy and resonance parameter dependences of the corresponding asymmetry coefficient α_{nf}^{fb} have been given by the following equations /2,3/:

$$W(\Theta) = 1 + \alpha_{nf}^{fb} \cdot (\vec{P}_n \cdot \vec{P}_f) \ ;$$

$$\alpha_{nf}^{fb} \simeq \sqrt{\frac{\Gamma_p^f \times \Gamma_p^n}{\Gamma_s^f \times \Gamma_s^n}} \cdot Re \left\{ \frac{(E - E_s) + i\Gamma_s/2}{(E - E_p) + i\Gamma_p/2} \cdot exp\,(-i(\varphi_p - \varphi_s)) \right\} .$$

Thirty two spectra of ^{235}U fission fragment kinetic energies for different neutron energies $1 \leqslant E_n \leqslant 140$ eV have been accumulated during a 300 hour experiment. All the results for the forward-backward asymmetry coefficients, as a function of neutron energies, are shown in fig. 1 and 2.

One can see 13 structures in the $\alpha_{nf}^{fb}(E_n)$ dependence as a minimum, which are in close connection with the vicinities of p-resonances. The different forms of these peculiarities can be understood as a result of a multi-level interference or as different values of the phase factor exp $(-i(\varphi_p - \varphi_s))$.

REFERENCES

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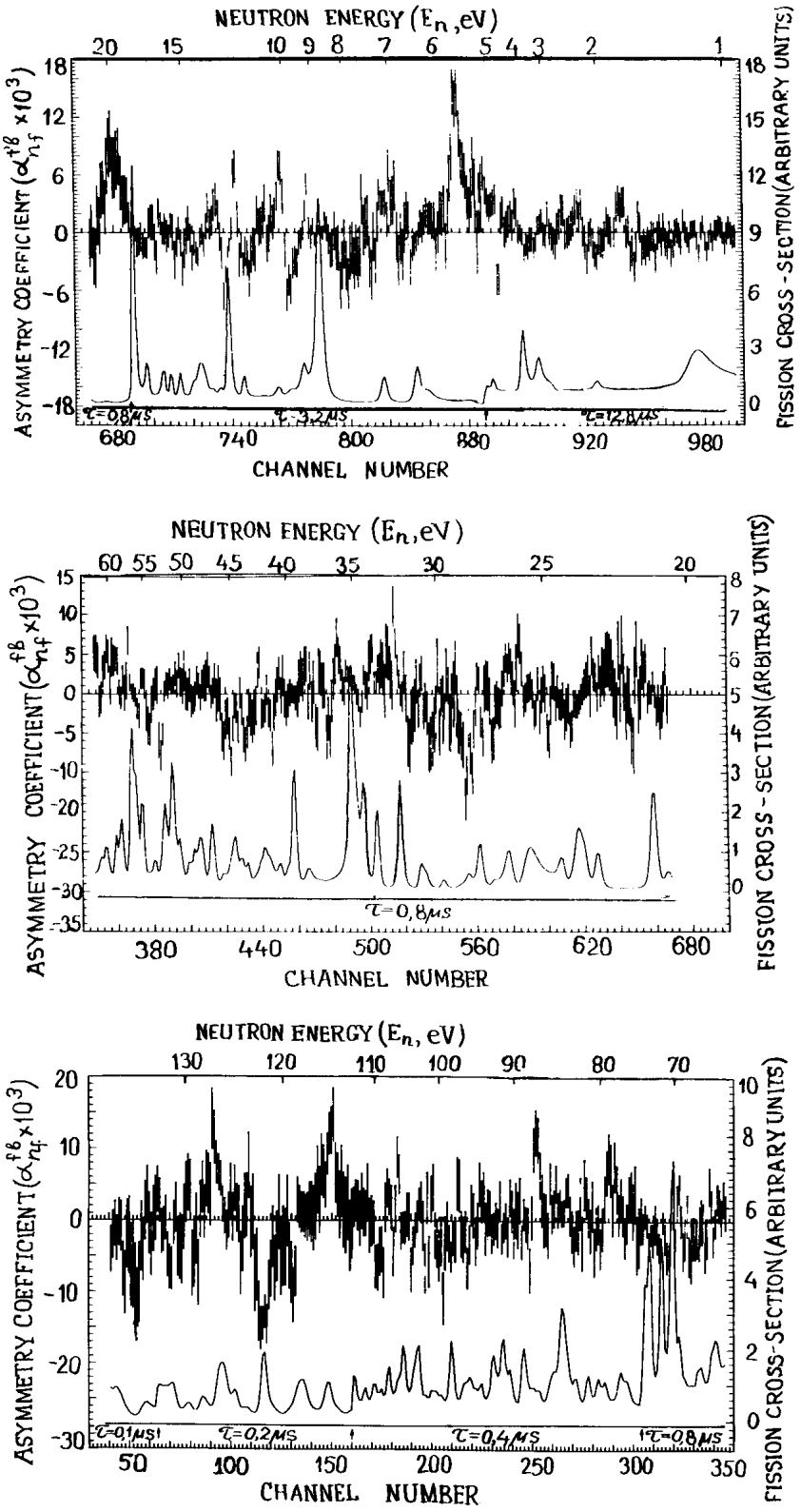

Fig. 1. Energy dependence of forward-backward asymmetry coefficient $\alpha_{nf}^{fb}(E_n)$ (experimental points) and fission cross section of ^{235}U. Arrows show borders of energy intervals with same time scales

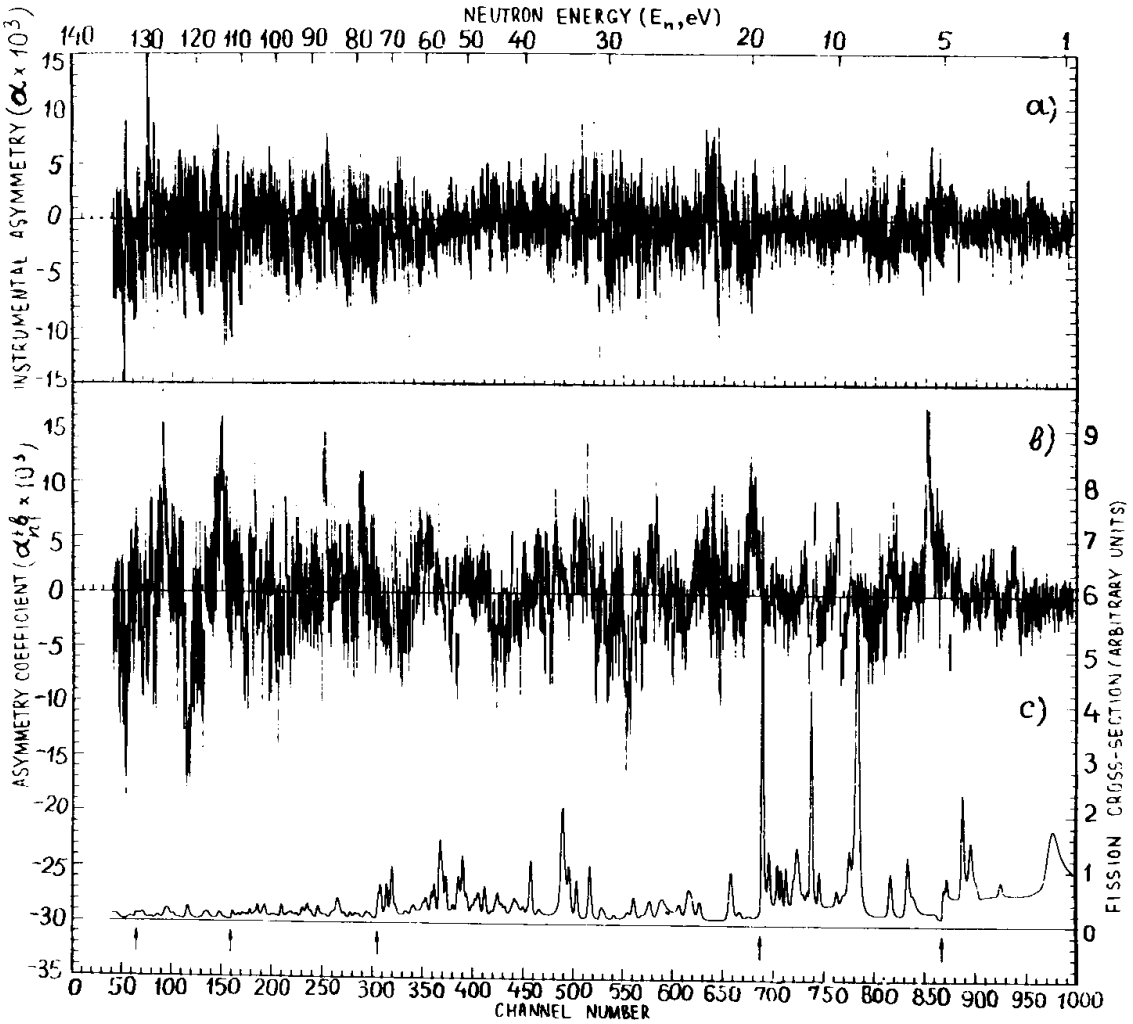

Fig. 2. General view of information accumulated in 300 hour experiment. *a*. Control result of instrumental asymmetry α; *b*. $\alpha_{nf}^{fb}(E_n)$ dependence on neutron energies; *c*. ^{235}U fission cross section