enhanced $< TKE >$ appear. When all three charges are comparable, e.g. as in the reactions shown in the Table, the process of the collinear three-body splitting of the heavy nucleus, induced by relativistic protons, takes place. As Z_3 comes to its limit Z_0 the process turns into the double α-decay or to two proton radioactivity.

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COMBINED ANALYSIS OF NEUTRON ENERGY DEPENDENCES OF P-ODD, P-EVEN LEFT-RIGHT AND P-EVEN FORWARD-BACKWARD ASYMMETRY EFFECTS OF ^{233}U FISSION FRAGMENT EMISSION

I. S. Guseva, G. A. Petrov, A. K. Petukhov, V. E. Sokolov, G. V. Val'ski, V. P. Alfimenkov[1)], L. B. Pikelner[1)]

[1)] I. M. Frank Laboratory of Neutron Physics, JINR, Dubna

It is well known that in the field of low neutron energies (E_n < keV) fission fragment angular distributions can be presented with a good aproximation as follows:

$$\frac{d\sigma}{d\Omega} \sim |f^s_{PC}|^2 + 2 \cdot f^s_{PC} \cdot f^p_{PC} + 2 \cdot f^s_{PC} \cdot f^s_{PNC} + |f^p_{PC}|^2 \qquad (1)$$

with $f^{s,p}_{PC}$ and f^s_{PNC} being the reaction amplitudes conserving (PC) and nonconserving (PNC) the space parity, as for E_n < keV it is essential to take into account s- and p-wave neutron capture only.

The first term is isotropic and the last one is relatively small for the energies (<10 eV) investigated in this work. Two terms remained contain the odd spherical harmonies resulting in the asymmetry the proper angular distributions relative to $\pi/2$ angle. These angular distributions are proportional to the unit vectors products as follows:

$(\vec{\sigma}_n \cdot \vec{p}_f)$ – P-odd asymmetry,

$\vec{\sigma}_n \cdot [\vec{p}_n \times \vec{p}_f]$ – P-even left-right asymmetry,

$(\vec{p}_n \cdot \vec{p}_f)$ – P-even forward-backward asymmetry.

Here $\vec{\sigma}_n, \vec{p}_n$ and $\vec{p}_f$ are unit vectors of neutron polarization and linear momentum and $\vec{p}_f$ - light fission fragment momentum relatively.

All these interference effects are considered by the modern theory [1,2] as having very similar mechanismes of arising in fission reaction, and their combined investigations seems to be very fruitful to extract a new information both about the weak interaction in complex nuclei and reactions and about reaction mechanizm itself. Certainly, if to speak about weak interaction P-even asymmetries play some auxiliary role as they can give information about mixed p-wave resonances parameters. The broad program of P-odd and P-even left-right asymmetry investigations as a function of polarized neutron energies have been performing at the polarizing crystal-difraction monochromator of WWR-M reactor since 1980 [3]. Neutron energy dependence of P-even forward-backward asymmetry in ^{233}U fission was studied at

the neutron pulsed source LUE-40/IBR-30 (JINR, Dubna). As a result combined analysis of there interference effects becomes possible [4] and is presented here shortly inside neutron energy range $E_n < 2$ eV in Fig.

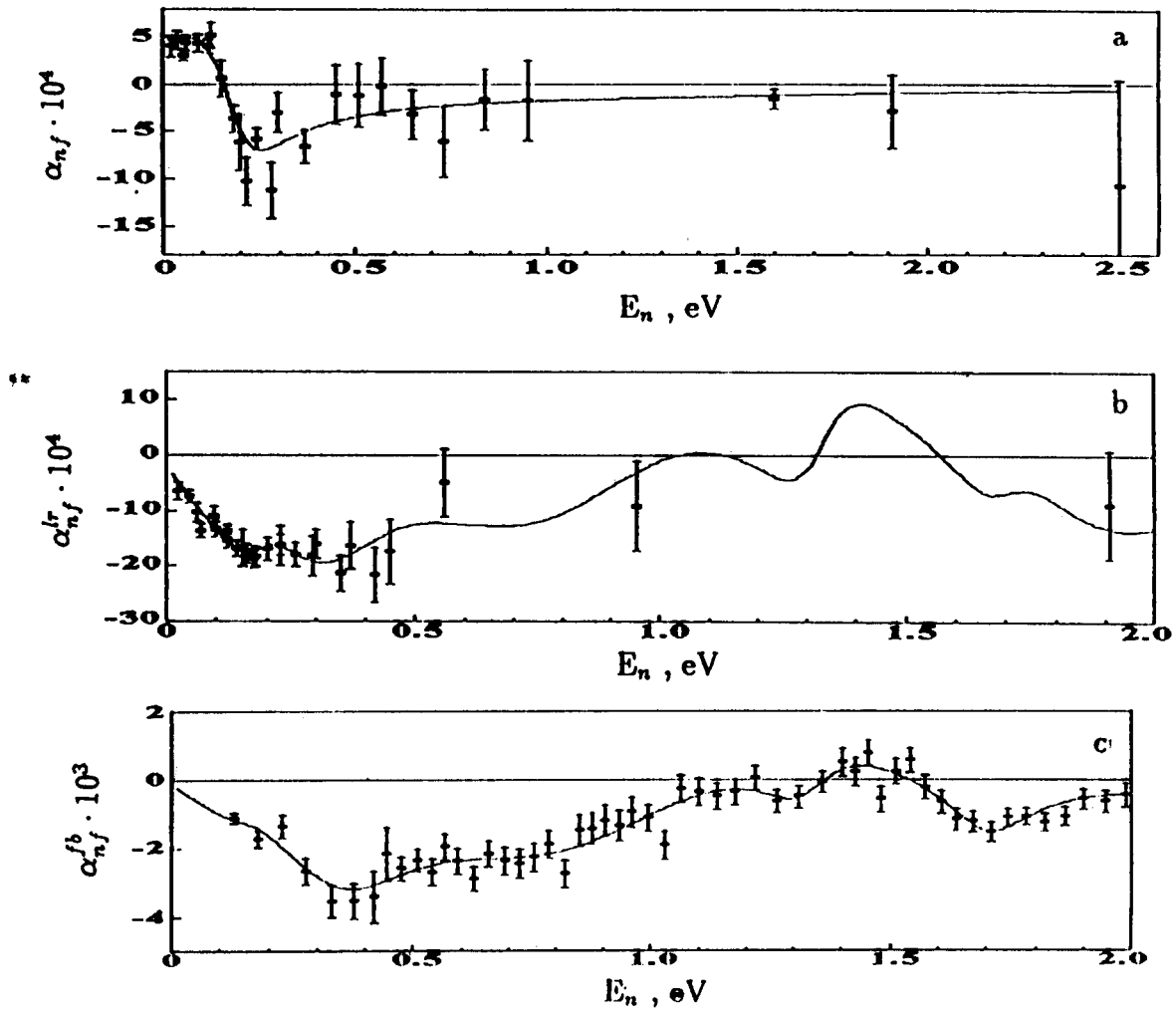

Fig. Results of the experimental investigation (points) and theoretical analysis (curve) of PNC-asymmetry effect(a), PC left-right interference effect(b) and PC forward-backward interference effect(c) in ^{233}U fission (see Table)

Theoretical equations, modified for the case of high level density used in analysis were taken from the works [1,2]. Parameters of s-wave resonances were ones from [5]. Weak p-resonance energies, total and neutron widths (Γ^p, Γ_n^p) and ratio of the neutron widths, total (Γ_n^p) and parital with a total momentum 1/2 ($\Gamma_n^{p\frac{1}{2}}$), were the fit parameters and were presented in Table.

Table

Weak p-resonance parameters obtained in the fit procedure of three interference effects

E_n,eV	J_p	Γ^p_f,eV	$\Gamma^p_{n1}\cdot 10^5$,eV	$\Gamma^{p\frac{1}{2}}_n/\Gamma^p_n$
0.16	2	0.14	1.1	1.0
0.35	3	0.35	28	0.8
0.87	3	0.79	57	0.9
1.33	3	0.15	8.4	0.9
1.70	3	0.15	15	1.0

** It is necessary to point out that one needs the only p-resonance 0.16 eV to fit P-odd asymmetry data in ^{233}U. All the other p-resonances take part according to the theory in P-even asymmetry effects forming only.

It can be seen all three interference effects being in a good agreement with the theory and to one another. We have been interested to get such an agreement as the attempts to perform combined analysis of three P-even interference effects in γ-ray angular distributions near isolated p-wave resonances [6] suffered a major set-back.

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NEUTRON ENERGY DEPENDENCE OF P-EVEN EFFECT OF FORWARD-BACKWARD ASYMMETRY OF ^{239}Pu FISSION FRAGMENT EMISSION IN THE RANGE 0.02-175 eV

A. M. Gagarski, A. P. Golosovskaya, I. S. Guseva, I. A. Krasnoschokova, A. M. Morosov, G. A. Petrov, V. I. Petrova, A. K. Petukhov, Yu. S. Pleva, V. E. Sokolov, V. P. Alvimenkov[1)], L. B. Pikelner[1)]

[1)] *I.M.Frank Laboratory of Neutron Physics, JINR, Dubna*

P-even effect of forward-backward asymmetry in ^{239}Pu fission fragment angular distribution has been observed and measured as a function of neutron energies inside energy interval