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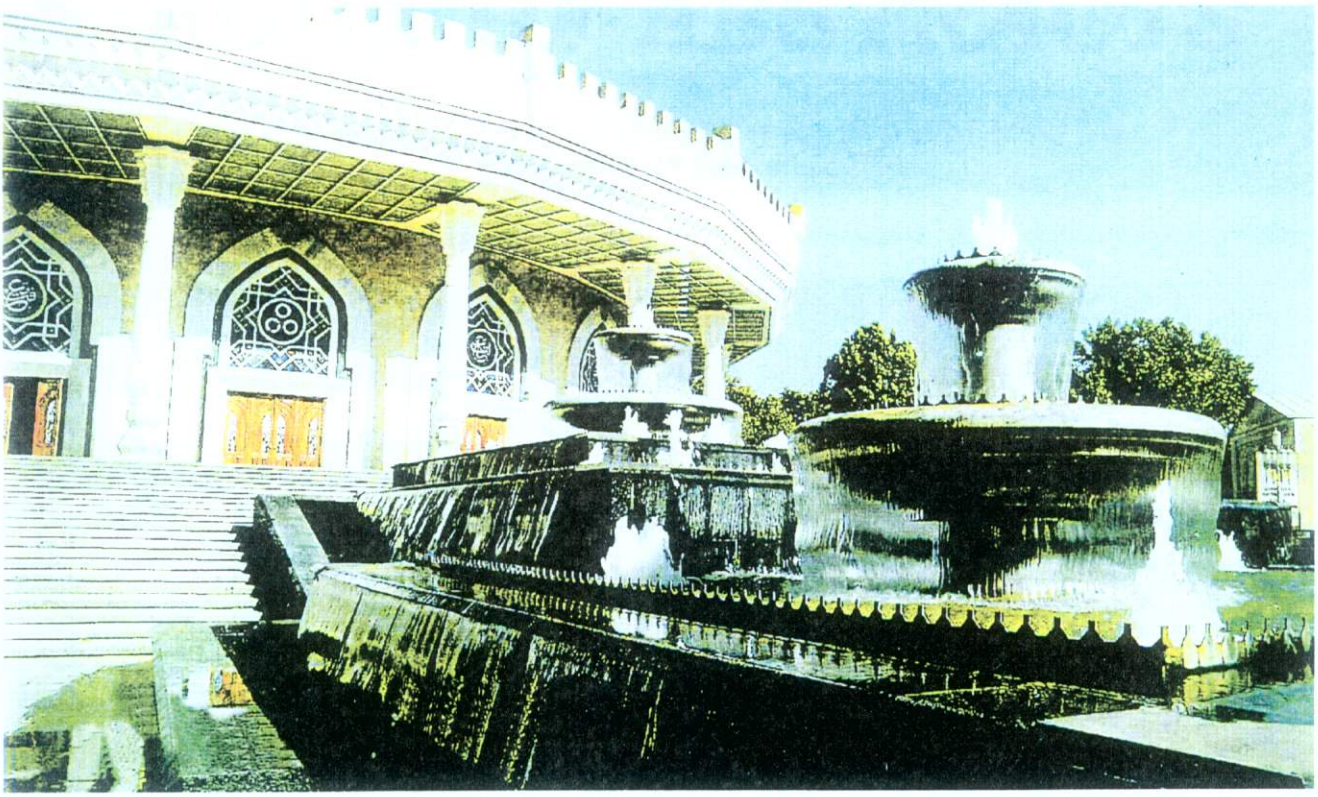

The Fourth International Conference

"MODERN PROBLEMS OF NUCLEAR PHYSICS"

BOOK OF ABSTRACTS

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TEZISLAR TÕPLAMI

TÕRTINCHI XALQARO ANJUMAN

«YADRO FISIKASINING HOZIRGI ZAMON MUAMMOLARI»

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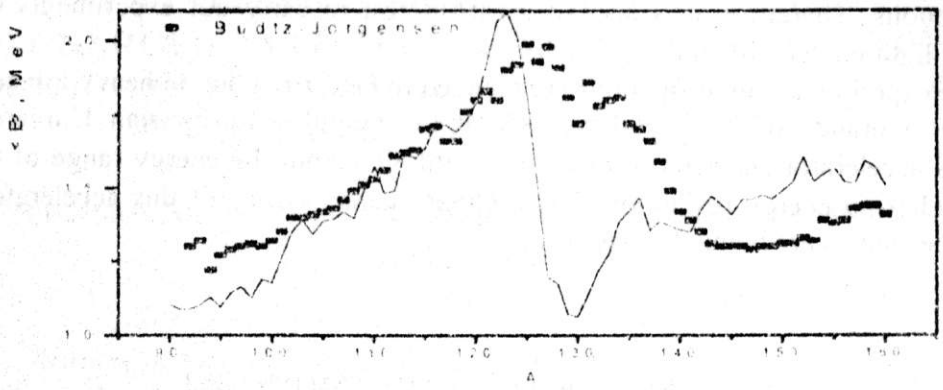

Fig. 2. Mean neutron energy as a function of fission fragment mass

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DO HADRONIC CHARGE EXCHANGE REACTIONS MEASURE ELECTROWEAK L=1 STRENGTH?

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Charge exchange reactions (A_Z, $A_{Z\pm1}$) induced by hadronic projectiles are a powerful tool for probing spin-isospin degrees of freedom in nuclei [4] The spin-isospin parts of the operators that mediate charge exchange reactions such as (p, n) are the same as those involved in the corresponding processes induced by electromagnetic and weak interactions. As a result, the matrix elements describing hadronic charge exchange reactions are closely related to those, describing the rates of β decay or the cross sections of reactions induced by neutrinos. An eikonal model has been used to find the relationship between calculated strengths for the first forbidden β decay and calculated cross sections for (p, n) charge exchange reactions. It is found that they are proportional for strong transitions, suggesting that hadronic charge exchange reactions may be useful in determining the spin-dipole matrix elements for astrophysically interesting leptonic transitions. Our results [5] imply that there should be an approximate proportionality of the observed cross section at the maximum of the charge exchange reaction exciting spin-dipole modes and the leptonic strength. Having established the basic apparatus here to examine this issue, it will be important next to examine transition densities for heavier nuclides, so as to determine whether their shapes are similar enough for cross sections and B_J strengths being proportional.

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