Analysis of differences between GMAP and SOK fits for ^{6}Li(n,t) reaction

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Largest difference between GMAP and SOK fits, both implementing the procedure of combining the RAC R-matrix result for 6Li(n,t) reaction with non-redundant data from full GMA database, is observed for ^{6}Li(n,t) reaction. GMAP used Chiba-Smith option for exclusion of PPP and SOK – logarithm transformation. The difference in the fit is shown in Fig.3, as ratios to the usual GMA fit not implementing any option to exclude PPP.

First what we see is that SOK result with log transformation (solid black line) goes even below usual (PPP is not excluded) GMA fit (value =1 at this plot) and GMAP result (red dash-dot line) goes above GMA as it is generally expected. As we know Chiba-Smith option includes (generally non-coherent) contributions from mini-PPP (just due to spread of data, which exists even in the fit of non-correlated data sets) and maxi-PPP (part induced by data correlations, see discussions at RCM-2 report, INDC(NDS)-453, p. 333). To check, to which extent the difference between SOK and GMAP can be induced by mini-PPP, the GMAP and GMA calculations for all standards reactions, where no correlations between the experimental data (cross-energy as well as cross-reaction) accounted, are compared at Fig. 1 and 2. As we see from solid black line, mini-PPP effect practically does not play any role for ^{6}Li(n,t) reaction below 1 MeV. Largest contribution of the mini-PPP is for ^{10}B(n,α_0) reaction where we have large spread of experimental data (please pay attention that all calculations were done without introducing of RAC results for ^{10}B in the combining fit). Mini-PPP effect at 235U(n,f) is less than 0.1% at most points.

RAC fit for ^{6}Li(n,t), which was used in the combining procedure, is shown on Fig.3 by blue short-dashed line. Green dashed line shows the GMAP fit if no correlations (cross-energy and cross-reaction types) are accounted. From this we may conclude that difference between GMAP and SOK is probably due to the difference in the way of maxi-PPP exclusion and difference in the methods of linearization. For ^{6}Li(n,t) this difference is between 0.1 and 0.6 % and is slightly above the uncertainty of the evaluated data.

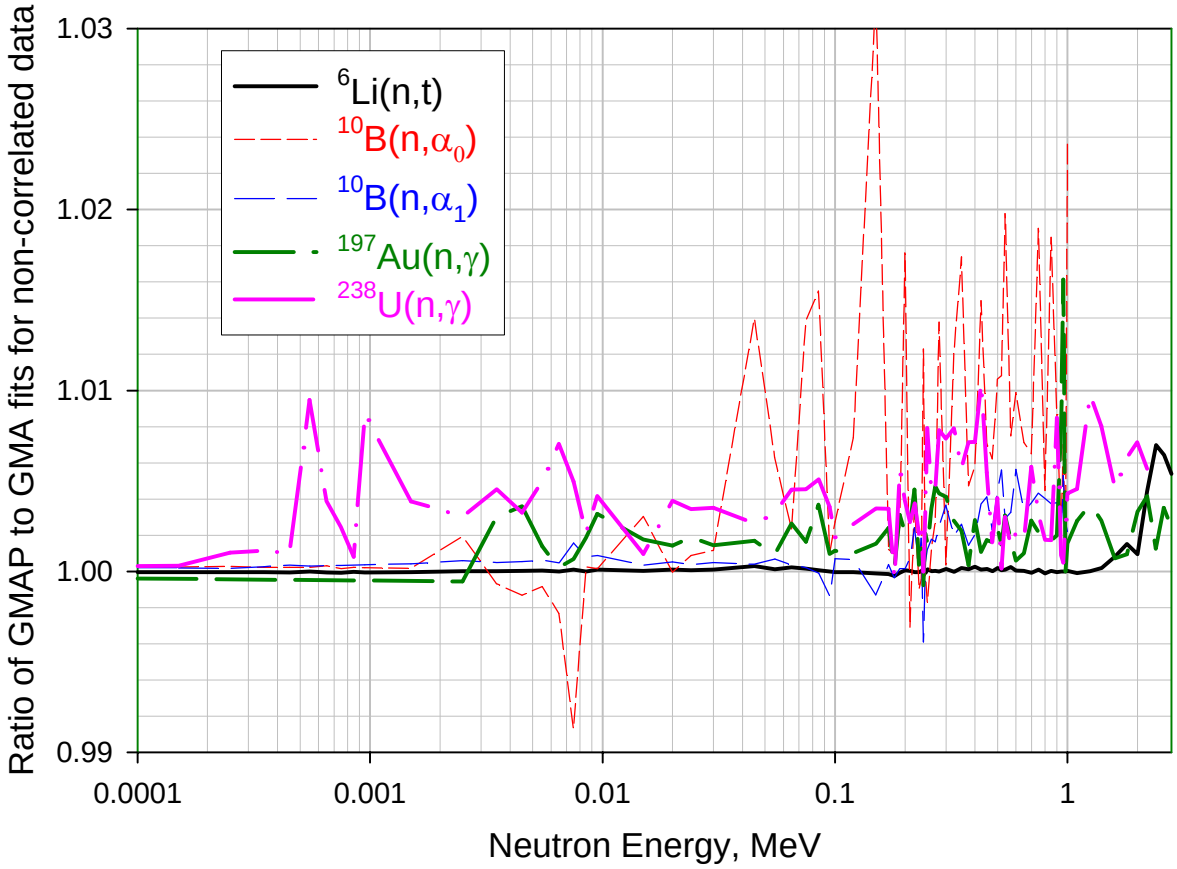

Fig. 1. Effect of mini-PPP due to a spread of data. 6Li(n,t) RAC fit is combined with full GMA database.

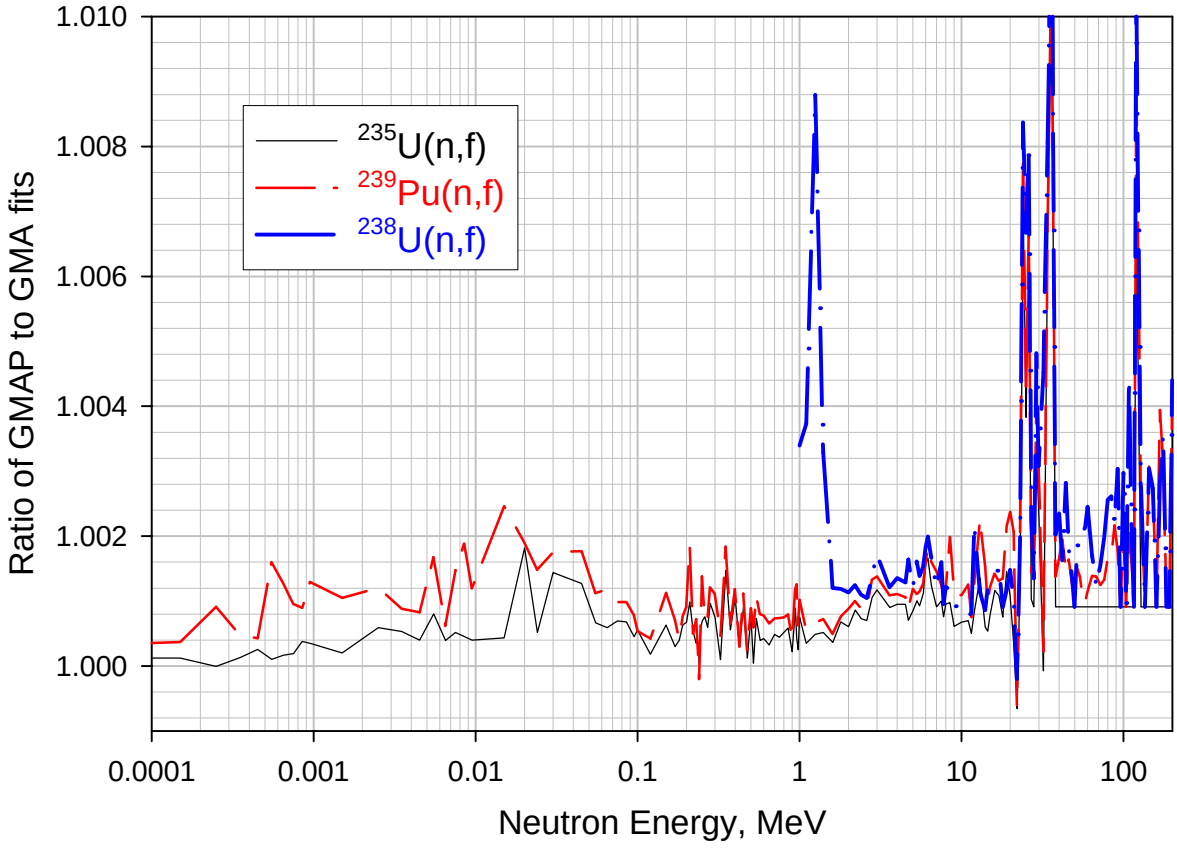

Fig. 2. Effect of mini-PPP due to a spread of data. 6Li(n,t) RAC fit is combined with full GMA database.

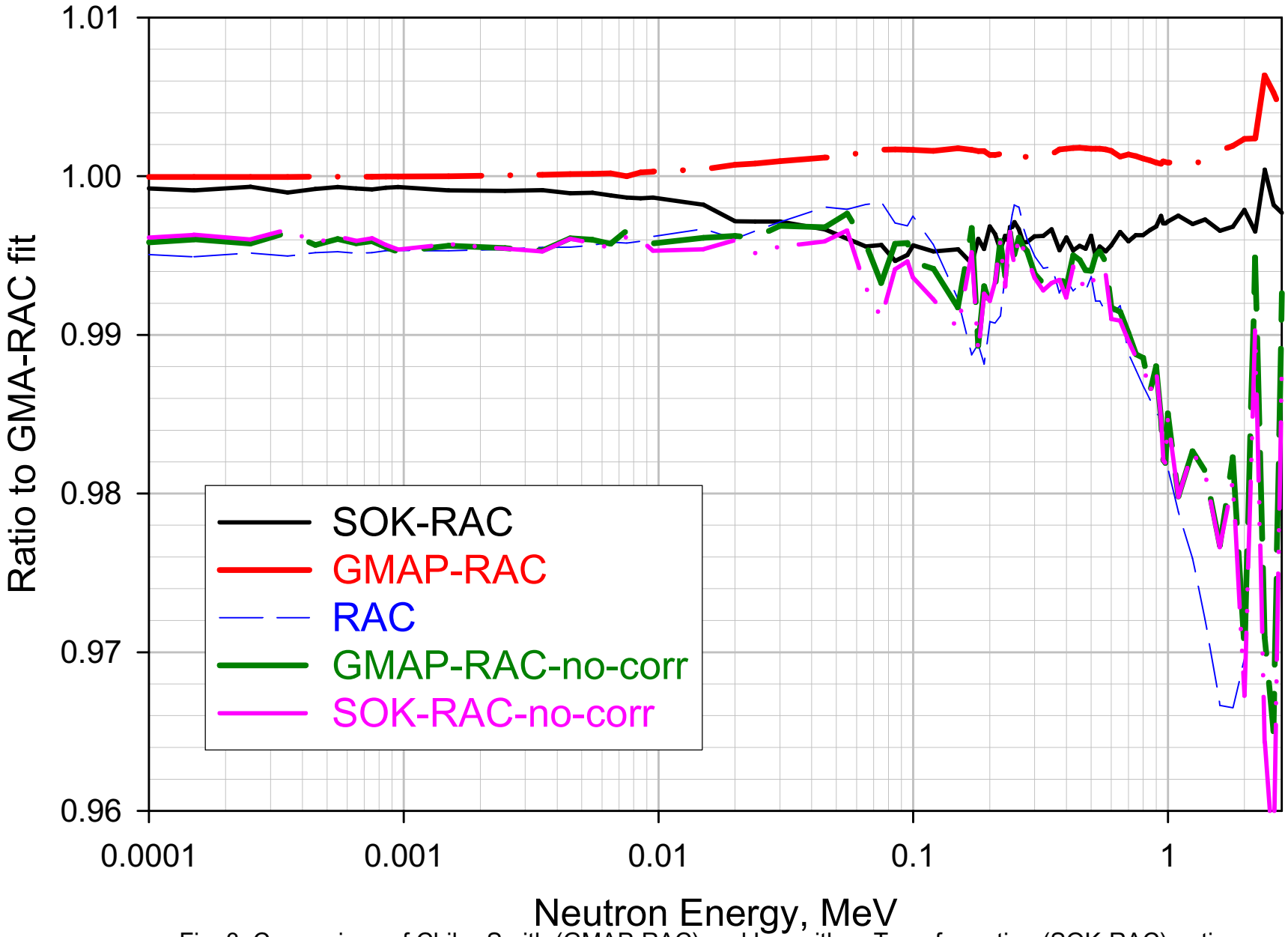

Fig. 3. Comparison of Chiba-Smith (GMAP-RAC) and Logarithm Transformation (SOK-RAC) options to exclude PPP for ^{6}Li(n,t) reaction.