REPORT ON A FUSTIPEN SUPPORTED VISIT TO GANIL
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Some days preceding my visit to GANIL I spent in Cadarache/Aix-en-Provence to be on the jury of the Ph. D. exam of Pierre Tamagno. Here I just report on my visit to GANIL.

During the first two days (October 21-22) of my visit I participated in a FUSTIPEN workshop which was focused on theoretical and experimental studies of fission-fragment properties. I had earlier learned of the new, high-accuracy SOFIA experiment in which fragment distributions $Y(Z,N)$ are measured with a resolution of better than one nucleon (at least in the lighter peak). But an earlier feature was that the energy of the fissioning compound systems were not well defined, but a distribution of excitation energies approximately in the range 9–16 MeV (range at half-maximum). However, now, new experiments and analysis techniques are starting to provide both mass yields at scission before neutron emission and charge yields, each at well-defined energies. This type of data is very useful for comparing and testing our models in their current stage of development. These results were presented in detail at the workshop.

Subsequently I had further, in depth discussion with Fanny Farget and Christelle Schmitt about these results and our potential-energy and Brownian shape-motion models. I was particularly interested in the new charge-yield data for uranium isotopes at low energies in the range 7-8 MeV, with sufficient resolution to show the odd-even staggering. Intriguing to me was that the charge yield for ^{234}U (in the light peak) was maximum at $Z = 38$ whereas for ^{238}U the maximum occurred at $Z = 40$. Since I just generalized our yield code to allow modeling charge yields with inclusion of odd-even staggering [LA-UR-15-26635, EPJA to be published]. I calculated yields with this code on my first day back, and I found the calculated results also obtained the maximum yield in the same locations. I used an earlier, simpler version of the code to obtain results immediately. We are now collaborating on more detailed comparisons and with data for additional isotopes and excitation energies.

I was also told that some heavy-ion experiments on fission yields are planned to study mass divisions in the predicted, contiguous region [PRC **91** 044316 (2015)] of asymmetric fission in the neutron-deficient Pb region. Only limited data is currently available here and from a theoretical standpoint it is very valuable to establish experimentally the specifics of such a contiguous region.

Alahari Navin brought up a different topic with me. As part of our calculations of ground-state masses we have calculated the effect of axial asymmetry on ground-state shapes and masses across the nuclear chart [PRL **97** 162502 (2006), ADNDT **94** 758 (2008)] and identified localized regions where nuclei in their ground states are calculated to be axially deformed. For example we found two regions of axially asymmetric nuclei around ^{108}Rb and ^{118}Rb with a region of axially (*symmetric* nuclei in between. Navin found experimental signatures of axial asymmetry in the whole region between ^{108}Rb and ^{118}Rb. Since we find that the calculated potential surface is essentially flat between $\gamma = 0$ and $\gamma = 60$ this experimental result may not contradict our results. Nonetheless one could consider the influence of higher axial shape degrees of freedom, for example Y_{42} and Y_{44}. For these relatively light nuclei I believe one should not consider higher multipoles than these. Polish groups have implemented such shape degrees in their codes and I provided contact information with Michael Kowal, so they might check this possibility. I will further discuss these results with Navin in the future.

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