We agree with the preceding Comment that the evaporation residue cross-section measurement is indeed a sensitive tool to study nuclear viscosity. The cascade calculations with the improved level-density description used by Díoszegi reproduce our evaporation residue measurement without nuclear viscosity. However, our cascade calculations were not used to reproduce the absolute magnitude of the evaporation residue cross section but rather the shape of the spin distribution. The calculations show that the spin distribution can be fitted to the standard calculation without dissipation in agreement with the Comment by Díoszegi. We conclude that the need to include nuclear viscosity effects in previous measurements must be due to strong viscosity outside of the saddle point.

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The purpose of our measurement [1] was to establish evaporation residue (ER) spin distribution as an important physical parameter to study the dynamical competition between ER and fission. We chose an energy regime where previous measurements reported effects of nuclear viscosity [2–5]. The origin of these effects, whether they predominantly originate from inside or outside the fission barrier is not clear. The potential change of the spin distribution leading to ER and fission for strong viscosity inside the barrier has been shown in previous calculations [6].

As pointed out in the preceding Comment by Díoszegi [7] it is crucial to reproduce fission or ER cross section and prefission particle or γ-ray emission simultaneously in order to extract the viscosity. Otherwise there are too many free parameters in the statistical model to clearly demonstrate an effect. Our paper [1] presented ER spin distributions as an additional observable that might be helpful to even further constrain the free parameters.

We agree with Díoszegi that the ER cross-section measurement is a sensitive tool and the level density description of the original cascade relies on an interpolation at intermediate excitation energies, which can lead to unphysical results and in future calculations the Reisdorf parametrization [8] should be used. We also agree with the Comment that the overall ER cross sections increase with the nuclear viscosity if it originated from inside the fission barrier.

However, our cascade calculation was not intended to reproduce the absolute magnitude of the cross section. A measurement of the cross section alone does not allow one to extract the viscosity due to the uncertainty of the measurements and the number of free parameters in the statistical model. Our calculations were performed to compare the shape of the evaporation residue spin distribution. We adjusted the fission barriers only to keep the overall normalization to the data constant. We did not want to imply any physical interpretation from the barrier parameter.

The shape of the measured spin distribution agrees with the standard cascade calculation and is in disagreement with a calculation using a viscosity parameter γ = 10. The Comment by Díoszegi confirms this conclusion from the comparison of the absolute cross section. Thus, the previously reported presence of large viscosity parameters [4,5], although not uncontroversial [9,10], has to originate predominantly from beyond the fission barrier, between the saddle and the scission point. These findings are also consistent with the recent results in 240Cf [11]. Our results do not rule out a small value of the viscosity parameter inside the saddle point, which was needed in Refs. [4,5]. These papers also required substantially larger viscosity parameters outside the saddle point.

In conclusion we agree with the Comment and appreciate the chance to clarify the conclusion of our original paper. We think that evaporation residue spin distribution measurements are an important additional observable in order to understand the origin of nuclear viscosity.