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## Search for a nuclear Josephson effect in $^{60}\text{Ni}+^{116}\text{Sn}$ sub-barrier transfer reactions with the PRISMA+AGATA set-up

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Sub-barrier transfer experiments have been recently carried out at LNL in the  $^{60}\text{Ni}+^{116}\text{Sn}$  system [1,2,3], where the two neutron transfer channel is well Q-value matched. Reaction products have been detected in inverse kinematic and at forward angles with the large solid angle magnetic spectrometer PRISMA, providing high efficiency and resolution. In these studies one follows the behavior of the transfer probabilities by varying the internuclear distance, a method which turned out to be fundamental to probe nucleon-nucleon correlation effects [4,5].

Very recently, the coupling of the AGATA gamma array to PRISMA offered a unique opportunity to study a nuclear (alternating current, AC) Josephson-like effect [6], with Cooper-pair tunneling between superfluid nuclei, whose manifestation has been recently proposed [7] using the  $^{60}\text{Ni}+^{116}\text{Sn}$  data as a stepping stone. Predictions have been made of a specific gamma strength function associated with the dipole oscillations generated by the, mainly successive, two neutron transfer process. We directly tested for the first time the possible manifestation of this important effect of Cooper pair behavior, observed to date only in condensed matter physics. The experiment has been carried out with very high statistics at a bombarding energy below the Coulomb barrier, corresponding to a distance of closest approach close to the estimated correlation length, exploiting the unique characteristics offered by the PRISMA+AGATA setup in terms of resolution and efficiency. This talk focuses on the ongoing analysis of these new results.

### References

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