# Particle emission time sequence in intermediate energy heavy ion reactions

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The CHIC Collaboration has performed a series of simultaneous *pp*, *np* and *nn* fermion interferometry experiments in order to study the space-time evolution of the emission sources in intermediate energy heavy ion reactions. The combined information from single particle spectra, *np* correlations probing the strong interaction, *nn* correlations probing in addition the wave function antisymmetrization and *pp* correlations probing in addition also the mutual Coulomb interaction, is very powerful for setting constraints on reaction models [1]. Furthermore, when correlations of non-identical particles are available, additional model independent information on the emission chronology of the particles can be obtained [2].
In this contribution we present the method to determine the order of emission of particles and we discuss the emission chronology of neutrons and protons deduced from the *np* correlation function for the E/A = 45 MeV $^{58}$Ni + $^{27}$Al reaction. The data suggest that the proton is on the average emitted from a smaller space-time volume than the neutron. Assuming a common source size, this would mean that protons are on the average emitted earlier than neutrons. This result is mainly valid for the pre-equilibrium source(s).
The method presented here opens up new possibilities to test different theoretical predictions. The possibility to establish a connection between the different time-scales of neutron and proton emission and the EOS asymmetry potential would put strong constraints on isospin-dependent theoretical models.

## References

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