

# Study of the $pp\eta$ system using the HBT interferometry method

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A large enhancement in the excitation function of the  $pp \rightarrow pp\eta$  reaction observed close to the kinematical threshold indicates a strong attractive interaction within the  $pp\eta$  system [1]. The effect can be described assuming, that the proton-proton pair is produced from a large object of a 4 fm radius [2]. A study of the  $pp\eta$  system is particularly interesting in the context of the search for the Borromean states. As Borromean we call a bound three-body system in which none of the two-body subsystems is bound. In nuclear physics the  ${}^{11}\text{Li}$  and  ${}^6\text{He}$  nuclei have been found to have such a property [3]. At present it is still not established whether the low energy  $pp\eta$  system can form a Borromean or resonant state. Recently the COSY-11 collaboration published high statistics data for the  $pp \rightarrow pp\eta$  reaction which will be used to elucidate this question [1]. This data are presently evaluated using the well known intensity interferometry method, commonly referred to as the HBT effect [4]. This technique permits the size of the source from which protons are emitted to be determined. It is based on the correlation function of two protons relative momenta. A comparison of the experimental results with theoretical predictions will be presented and the achieved accuracy of the determination of the spatial size of the source will be discussed. The presentation will also comprise a description of the method developed for the construction of the correlation function free from the multi-pion background.

## References:

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