



Nuclear Theory

# Constraining the neutron-neutron scattering length with $\leftarrow{nopi}$

Johannes Kirscher, Daniel R. Phillips

(Submitted on 16 Jun 2011)

We compute a model-independent correlation between the difference of neutron-neutron and proton-proton scattering lengths  $|a(nn)-a^C(pp)|$  and the splitting in binding energies between Helium-3 and tritium nuclei. We use the effective field theory without explicit pions to show that this correlation relies only on the existence of large scattering lengths in the NN system. Our leading-order calculation, taken together with experimental values for binding energies and  $a^C(pp)$ , yields  $a(nn)=-22.9 \pm 4.1$  fm.

Comments: 28 pages, 6 figures, 2 tables

Subjects: **Nuclear Theory (nucl-th)**; Nuclear Experiment (nucl-ex)

Cite as: **arXiv:1106.3171 [nucl-th]**  
(or **arXiv:1106.3171v1 [nucl-th]** for this version)

## Submission history

From: Johannes Kirscher [[view email](#)]

[v1] Thu, 16 Jun 2011 08:56:04 GMT (393kb)

*Which authors of this paper are endorsers?*

Link back to: [arXiv](#), [form interface](#), [contact](#).

## Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

nucl-th

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1106](#)

Change to browse by:

[nucl-ex](#)

## References & Citations

- [INSPIRE HEP](#)  
([refers to](#) | [cited by](#))
- [NASA ADS](#)

Bookmark([what is this?](#))

