





The new source for ultracold neutrons at TRIGA Mainz: latest results

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Outline:

- TRIGA Mark II Reactor with pulsed mode
- The new UCN source at beam port D
- Measurements during the last year
 - Heat load and its influence on the converter quality
 - Measurement of the thermal neutron flux
 - > UCN density measurements
 - > MC Simulations
- Summary and Outlook

TRIGA Mark II Reactor with pulsed mode



September 10th, 2013

Talk for the 3rd Workshop of PSI 2013 by Jan Peter Karch, Inst. of Physics, Uni. Mainz

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The new UCN source at beam port D



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The new UCN source at beam port D



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Measurements during the last year

Heat load and its influence on the converter quality





Source of heat load



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Heat load and its influence on the converter quality



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Heat load and its influence on the converter quality







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Heat load reduce the UCN yield in the case of *no and/or* sD_2 *pre-moderator*. With a H_2 or CH_4 pre-moderator there is no visible influence, even after 100 reactor pulses.



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Measurement of the thermal neutron flux



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Thermal neutron fluence versus UCN yield

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UCN density measurements



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UCN density measurements: glass guiding system

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Glass tubes coated with NiMo 85/15 in our sputter facility



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Results from the different measurements:



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Results from the different measurements:



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MC Simulations

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ndet 63

elapsed

12.6 s

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detector

MC Simulations

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Results from simulations



MC Simulations

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In total, we can report that the UCN source at the TRIGA Reactor Mainz (beam port D) is a powerful source for UCN experiments: <u>stable operation conditions</u> and <u>room for</u> <u>increasing the UCN yield</u>.



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Thank you for your attention!

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