Meson Production on the Neutron at ANKE

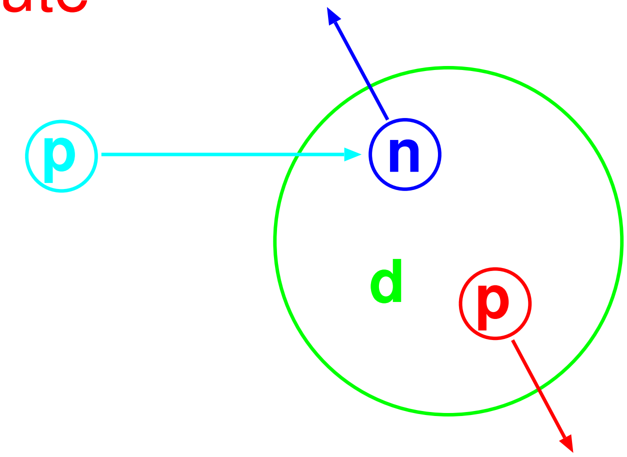
I.LEHMANN, S.BARSOV, S.DYMOV, T.KRINGS,
G.MACHARASHVILI, S.MERZLIAKOV,
A.MUSSGILLER, D.PROTIĆ
and R.SCHLEICHERT
for the ANKE Collaboration

March 2001

Institut für Kernphysik
Forschungszentrum Jülich

Physics on the Neutron

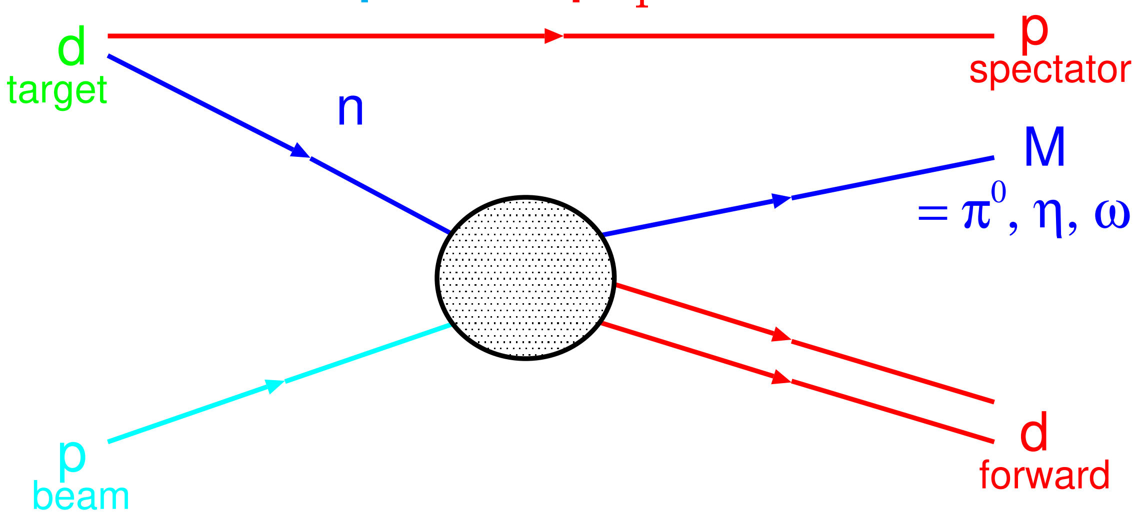
deuteron as a substitute
for a non-existing free
neutron target
assume quasi free
kinematics



- Detecting pn-reaction products only:
  High uncertainty in Q due to Fermi motion

- Detecting the spectator proton:
  Fix "neutron" kinematics $\Rightarrow$ Q-value
  $pd \to p_{sp}X \mathrel{\hat{=}} pn \to X$

$$pd \to p_{sp}dM$$



- Identify the meson M by missing mass!

Outlook

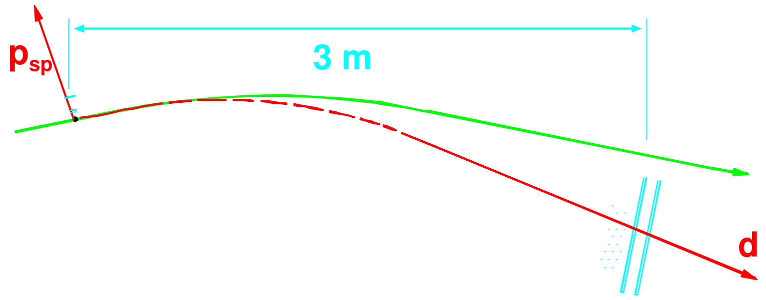
Beam Time August 2001

- Vary beam energy for detailed background studies.
- Gain statistics for pn$\rightarrow$dω.

$\hookrightarrow$ Estimate for the total beam time needed.

Further Improvements

- Identify deuterons explicitly using TOF (new electronics for silicon detectors, timing $\leq$ 1 ns FWHM).



- Improve missing-mass resolution by higher angular resolution in the silicon telescope(s).