

Nuclear Theory

Mach-like emission from nucleon scattering in proton-nucleus reaction

G. Q. Zhang, Y. G. Ma, X. G. Cao, C. L. Zhou

(Submitted on 17 Jun 2011)

The fast-stage nucleon emission of proton-nucleus (pA) reactions from 300A MeV to 1.8A GeV has been investigated using the quantum molecular-dynamics model. It is found that the sideward angular spectrum of nucleon emission presents an interesting Mach-like structure at the early stage of the collision (tens of fm/c). The sideward angular peak value varies from about 45° to near 73° , depending on the bombarding energy. Nucleons emitted from the vicinity of the sideward peak tend to have a fixed momentum value about 0.5 GeV/c, independent of the bombarding energy as well as the impact parameter. Additionally, the sideward angular peak value is almost independent of the equation of state, indicating that binary collision at the early fast stage in the intermediate energy pA reaction plays an important role in the emergence of Mach-like emission.

Comments: 4 pages, 6 figures

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

Journal reference: Phys.Rev.C83:064607,2011

DOI: [10.1103/PhysRevC.83.064607](https://doi.org/10.1103/PhysRevC.83.064607)Cite as: [arXiv:1106.3388](https://arxiv.org/abs/1106.3388) [nucl-th](or [arXiv:1106.3388v1](https://arxiv.org/abs/1106.3388v1) [nucl-th] for this version)

Submission history

From: Yu-Gang Ma [[view email](#)]

[v1] Fri, 17 Jun 2011 05:50:24 GMT (88kb)

[Which authors of this paper are endorsers?](#)

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?](#))

