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**Non-uniqueness of transonic shock solutions to non-isentropic Euler-Poisson system.** (English) [Zbl 1479.35008](#)  
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**Summary:** In this paper, we study the non-isentropic Euler-Poisson system and the non-uniqueness of transonic shock solutions is obtained. More precisely, prescribing a class of physical boundary conditions on the boundary of a flat nozzle with finite length, we prove that there exist two and only two transonic shocks. This is motivated by the result of existence of multiple transonic shock solutions for isentropic Euler-Poisson system [*T. Luo and Z. Xin*, *ibid.* 10, No. 2, 419–462 (2012; [Zbl 1286.35165](#))]. Moreover, the monotonicity with a threshold between the location of the transonic shock and the density at the exit of the nozzle is established.

**MSC:**

- [35A02](#) Uniqueness problems for PDEs: global uniqueness, local uniqueness, non-uniqueness
- [35L67](#) Shocks and singularities for hyperbolic equations
- [35Q31](#) Euler equations
- [35Q35](#) PDEs in connection with fluid mechanics

**Keywords:**

Euler-Poisson system; non-isentropic system; non-uniqueness; transonic shocks

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