

## عنوان مقاله:

مطالعه عددی تأثیر پاشش متقاطع جت هوا قبل از جت سوخت در جریان هوای عبوری مافوق صوت

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## نویسندگان:

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## خلاصه مقاله:

Transverse fuel injection in supersonic crossflow of scramjet combustors is one of the common methods for fuel-air mixing. Air jet injection before fuel jet can improve fuel penetration but with the excess stagnation pressure loss. In this paper, the position of air jet is changed to find the position that maximum fuel jet penetration height and minimum stagnation pressure loss is achieved. For numerical simulations, Two-dimensional Navier-Stokes equations and k- $\omega$  sst turbulence model and the perfect gas equation are solved. Then the results of the numerical solution are compared and validated with experimental data. Numerical results showed good agreement with the experimental values. In the experimental test, Helium is injected into supersonic crossflow and so numerical simulation is started with Helium injection. In scramjet usually, hydrogen was used as fuel. Therefore, hydrogen fuel injection is used for the parametric study. In the case of air injection near the fuel injection, maximum fuel penetration with minimum stagnation pressure loss is achieved.

## کلمات کلیدی:

پاشش متقاطع، جریان عبوری مافوق صوت، دیسک ماخ، تلفات فشار سکون

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