

The Investigation of Crossflow and Off-the-Surface Velocity Traces for a Moderately Swept Wing at Transonic Mach Numbers

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Singular Points and Flow Topology



Adopted Tobak and Peake's* terminology

- A line of separation is present when the skin-friction lines emerging from a nodal point of attachment are prevented from crossing by the presence of a particular skin-friction line emerging from the saddle point.
- *Global* line of separation is defined as a skin-friction line emerging from a saddle point which other lines converge onto and leads to *global* separation.
- *Local* line of separation is defined as a skin-friction line that does not emerge from a saddle point which other lines converge onto and leads to *local* separation.
- Most researchers agree that the convergence of skin-friction lines on either side of a particular line is a necessary condition for separation however, it should not be used solely to define it as this may occur in other situations as well.

* M. Tobak & D.J. Peake: Topology of three-dimensional separated flows. Ann. Rev. Fluid. Mech. (1982)

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Singular Points and Flow Topology





- <u>Nodal Point</u>: is a point common to an infinite number of velocity lines.
- <u>Focus</u>: a point in which an infinite number of velocity lines spiral around.
- <u>Saddle Point</u>: is a point in which only two velocity lines pass through.

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