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Experiments on a two-dimensional laminar separation bubble. (English) Zbl 0981.76506
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Summary: A two-dimensional separation bubble on a flat plate is studied experimentally by means of hot-wire anemometry and flow visualization. Separation of the laminar boundary layer on the plate is caused by an adverse pressure gradient imposed by a curved wall opposite to the plate. The instability of, and transition process in, the separation bubble are focused on. The bubble is found to be highly susceptible to high-frequency two-dimensional instability waves, which are studied under both natural and forced conditions. A similar development of these instability waves in the separation bubble is found in both cases. The exponential growth of the two-dimensional disturbances dominates the flow except for in the reattachment region, where large-scale three-dimensional structures appear. Some difficulties associated with experimental investigations of boundary-layer separation-bubble flows are discussed.

MSC:

[76-05](#) Experimental work for problems pertaining to fluid mechanics
[76D10](#) Boundary-layer theory, separation and reattachment, higher-order effects

Cited in **14** Documents

Keywords:

[laminar separation bubbles](#); [instability waves](#); [laminar turbulent transition reattachment](#)

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