



# COLLOQUIUM

Conform artikel 4.6.8 van het SSNS-wb.

Vakgroep: **Technische Stromingsleer**

In het kader van zijn doctoraalopdracht zal

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een voordracht houden getiteld:

Control of flow separation in a diffuser: an experimental study

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Korte samenvatting:

In many situations flow separation causes undesirable effects, for example loss of efficiency for wind turbines. Control of flow separation aims at a reduction of these effects. Flow control is performed passively, for example by interaction of the flow with a whistling Helmholtz resonator, or actively, with steady blowing through a slit or with intermittent blowing and suction by means of synthetic jets. Synthetic jets are devices which consist of an open cavity, driven by a loudspeaker or an oscillating piezo-electric membrane. The oscillation results in alternately blowing through the cavity exit in the form of a jet, and suction in the form of a potential sink type of flow. Depending on the shape of the cavity exit, the jet can be directed normal to the main flow or along the wall.

Experiments have been performed in a two-dimensional diffuser, attached to the 0.17 m x 0.17 m<sup>2</sup> silent wind tunnel of the University of Twente. As a first step towards flow control with synthetic jets, steady blowing and a whistling Helmholtz resonator have been investigated. The purpose was to study the influence of parameters such as slit width and slit geometry.

The experimental results are compared to results of boundary layer theory for laminar flow (Thwaites' method) and turbulent flow (Head's method).

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