



# **ESSL SEMINAR**

## **Aviation Impact on Climate**

**Ulrich Schumann**

**Deutsches Zentrum für Luft- und Raumfahrt (DLR)**

**Institute of Atmospheric Physics**

**Oberpfaffenhofen, Germany**

Aviation impacts the state of the atmosphere and possibly climate change mainly by emissions of carbon dioxide, nitrogen oxides, contrails, and particles. Estimates of aviation induced radiative forcing for the year 2000 range from 2 to 8 %, with a best estimate near 3 %. Our limited understanding of cirrus formation including contrail cirrus and soot cirrus are the main reasons for the large uncertainties. Also the impact of aviation emissions on air chemistry near the tropopause is still not sufficiently known. Over the last decade, aviation fuel consumption grew by 3 % per year, the related nitrogen oxides emissions grew even faster. A simple linear climate response model shows that the foreseen technology improvements may not be sufficient to limit aviation's climate impact for the expected growth rates, in particular when present radiative forcing is close to the higher estimates. Some examples will be presented to illustrate our ongoing research.

**Thursday, 5 June 2008 – Seminar at 3:30 p.m.**

**Refreshments served at 3:00**

**NCAR – Foothills Laboratory**

**3450 Mitchell Lane**

**Building 2, Auditorium, Room 1022**