**Effect of inertia and gravity on the turbulence in a suspension**
GIJSBERT OOMS, Delft University of Technology, PIETRO POESIO, University
of Brescia — A theoretical model is presented for the effect of particle inertia and
gravity on the turbulence in a homogeneous suspension. It is an extension of the
one-fluid model developed by L'vov, Ooms and Pomyalov (2003), in which the effect
of gravity was not considered. In the extended model the particles are assumed to
settle in the fluid under the influence of gravity due to the fact, that their density is
larger than the fluid density. The generation of turbulence by the settling particles
is described, special attention being paid to the turbulence intensity and spectra. A
comparison is made with DNS calculations and experimental data. Also a sensitivity
study is carried out to investigate at which conditions the gravity effect becomes
important. With the model it is possible to calculate the significance of the two-way
coupling effect as function of the relevant dimensionless groups. Also an explanation
in physical terms is given.

Gijsbert Ooms
Delft University of Technology