Für die "Lösung" bitte pdf auf Seite 2 weiterblättern

Das pdf ist im Letter Format (216 x 279), auch wenn A4 (210 x 297) spezifiziert wurde. Oft passiert der Fehler bei der Umwandlung von dvips zu pdf.

Machen Sie uns eine Freude und schauen Sie auch als LaTeX User ihr pdf an bevor Sie es hochladen.

[illegible]Mass

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$$\frac{\partial \rho}{\partial t} + \frac{\partial (\rho u_i)}{\partial x_i} = 0. \quad (2.1)$$

In the context of reactive flows a formulation of the conservation of mass for n species is desirable. In this case a species source term or sink term [illegible] is likely to be present due to the reaction. In contrast to the total mass [illegible] a diffusion term has to be included here, since species [illegible] be spatially non-uniform. Defining the mass fraction of the species k:

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$$Y_k = \frac{\rho_k}{\sum_{i=1}^{n} \rho_k}, \quad (2.2)$$

$$\frac{\partial (\rho Y_k)}{\partial t} + \frac{\partial (\rho u_j Y_k)}{\partial x_j} = \frac{\partial}{\partial x_j}\left[\rho D \frac{M_k}{M}\frac{\partial X_k}{\partial x_j} - Y_k V_i^c\right] + \mathscr{S}_i, \quad (2.3)$$

where the first term on the right hand side accounts for diffusion, with X_k being the molar fraction of species k, M_k the molar weight of species k and D_k being the diffusion coefficient for species k. The term V_i^c is defined as

$$V_i^c = \sum_{k=1}^{n} D_k \frac{M_k}{M}\frac{\partial X_k}{\partial x_i} \quad (2.4)$$

and ensures global mass conservation after introduction of the diffusion law [2].

2.1.2 The Compressible Navier-Stokes Equations

The Navier-Stokes equations are nam[illegible]n and physician Claude Louis Marie Henri [illegible] mathe-matician and physician Sir George Ga[illegible]ations can be derived from a balance of mo[illegible]rmore,

Leicht zu erkennen ist Letter am deutlich zu geringen Rand unten.

2.1.1 The Conservation of Mass

The conservation of mass can be derived by considering the mass-fluxes entering and leaving an infinitely small volume element. In the absence of a source of mass, the equation of the conservation of mass can be written as follows:

$$\frac{\partial \rho}{\partial t} + \frac{\partial \left(\rho u_i\right)}{\partial x_i} = 0. \tag{2.1}$$

In the context of reactive flows a formulation of the conservation of mass for n species is desirable. In this case a species source term or sink term $\mathcal{S}_k$ is likely to be present due to the reaction. In contrast to the total mass balance, a diffusion term has to be included here, since species fractions may be spatially non-uniform. Defining the mass fraction of the species k:

$$Y_k = \frac{\rho_k}{\sum_{i=1}^{n} \rho_k}, \tag{2.2}$$

$$\frac{\partial \left(\rho Y_k\right)}{\partial t} + \frac{\partial \left(\rho u_j Y_k\right)}{\partial x_j} = \frac{\partial}{\partial x_j}\left[\rho D_k \frac{M_k}{M}\frac{\partial X_k}{\partial x_j} - Y_k V_i^c\right] + \mathcal{S}_i, \tag{2.3}$$

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So muss es aussehen :-)

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