

Data for ‘Structure and nitrogen oxide emissions of confined turbulent hydrogen jet flames’

T. L. Howarth, S. Nerzak, P. Gruhlke, J. T. Lipkowitz,
L. Panek, S. Pfadler, M. Gauding, H. Pitsch

Three direct numerical simulation databases were generated for this publication, denoted as L2, L3 and L4. **Details on the setup can be found in the paper.** The full dataset is around 10TB. The following data is stored for each case:

- Setup files - `pelelmex_prob.cpp,pelelmex_prob.H`
- Input files - `input.3d, pmf-H2-NOX_20_noArHe-phi0.5-T530-p8.dat, turb_inflow`
- Single restart file - `chkXXXXXX`
- Plot files - `pltXXXXXX`.

Plot files are stored in AMReX-native format, and can be analysed using AMReX-native tools (e.g. PeleAnalysis) or yt. For visualisation, follow the guides provided by the AMReX documentation. Each of the plot files contains the following data:

- Velocities (`x_velocity, y_velocity, z_velocity`)
- Velocity divergence (`divu`)
- Vorticity magnitude (`mag_vort`)
- Pressure gradients (`gradpx, gradpy, gradpz`)
- Scalar fields (`density, temp, rhoh`)
- Species mass fractions (`Y(H2), Y(O2), Y(NO), ...`)
- Chemical source terms (`I_R(H2), I_R(O2), I_R(NO), ...`)
- Heat release rate (`HeatRelease`)
- Age variables (`rhoA, ...`)
- Passive scalar (`rhoC`)

Data for this publication is stored in an object-based form (S3). Given the size of the dataset, it is highly recommended to download the data directly to high-capacity storage using an S3 client. Please see the other attached document regarding data access.