BgMitt – Notes on program use

The demonstration program ***BgMitt*** for averaging according to the balance sheet works with the files B (Input), C (Output), D (Input, Output) and E (Output), as shown in the global flowchart (Figure 33 of the standard VDI 4675 Part 2) – with all or with a subset depending on the sequence option.

It opens up a series of options that can be selected interactively at the beginning of the program flow:

1. Is a lateral entry desired with the file D as input?
2. Should cylindrical coordinates be used instead of cartesian coordinates?
3. If question 1 is answered in the negative, the program prompts you to enter the name of the file B to be specified. You are also asked for their format:
   – 0 for IJ arrangement of a structured data network
   – 1 for quadrilateral elements of an unstructured data network
   – 2 for trilateral elements of an unstructured data network

   Should a short-term balance averaging be carried out?
4. If the answer to question 1 is in the affirmative, the program prompts you to enter the name of the file D.

In addition to the Fortran source *BgMitt.for* and the executable *BgMitt.exe*, a series of example files are provided. They come from the application example "exhaust casing" of the standard. These are the flow fields of evaluation plane 2 in Cartesian coordinates and the diffuser exit plane in cylindrical coordinates.

The ASCII files B and C have a Tecplot format:

Ebene2-B.plt	Finite element Data, triangle element type
Ebene2-B-fequad.plt	Finite element Data, quadrilateral element type (to be renamed to *Ebene2-B.plt* when used)
Ebene2-B-ij.plt	IJ-Ordered Data (to be renamed to *Ebene2-B.plt* when used)
Ebene2-C.plt	Finite element Data, triangle element type
DiffAus-zyl-B.plt	IJ-Ordered Data

The ASCII files D and E are text files:

Ebene2-D.dat, *Ebene2-E.dat*, *DiffAus-zyl-D.dat*, *DiffAus-zyl-E.dat*

File structure

Files B and C (finite element data, triangle or quadrilateral element type):

1. File header with Tecplot elements

   Line 1: file name from column 10 to 29
   Line 2: name of the stored field sizes
   Line 3: file name from column 24 to 43
   Line 4: text from column 24 to 63
   Line 5: text from column 24 to 63
   Line 6: special gas constant from columns 39 to 53 (1*15)
   Line 7: coefficients of the c_p polynomial from column 39 to 113 (5*15)[1]
   Line 8: default values of pressure, temperature, enthalpy and entropy from column 39 to 98 (4*15)
   Line 9: Pr_{tur} and σ_k from column 39 to 68 (2*15, only if short-term averaging is intended!)
   Line 9 or 10: number of data points N (columns 16-20), number of elements E (columns 24-28)

2. Field sizes in the data points according to line 2, N lines

3. Connectivity list, E lines

Files B (IJ-Ordered Data):

1. File header with Tecplot elements

   Lines 1 to 9: see above
   Line 9 or 10: number of data rows I (columns 16-20), number of data columns J (columns 24-28)

2. Field sizes in the data points according to line 2, I*J lines, the I index runs fastest

Files D as input:

The sample files are to be used as a mask without changing the line order. The Data are available from column 33, each 15 columns wide.

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[1] Currently only 2nd degree polynomials are supported, i.e. with max. three coefficients.