GUIDELINES FOR THE PREPARATION OF CAMERA-READY MANUSCRIPTS FOR PROCEEDINGS (P1 to P4) ➡ see also the TEXT SAMPLES: P3/4 and P4/4

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TEXT SAMPLES (typing area 117 mm x 189 mm, text 10pt, except for headings, figure legends, and table captions)

Adaptively Refined Cartesian Grid Generation and Euler Flow Solutions for Arbitrary Geometries

--- Title, 14pt, bold type, centred

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Summary

--- Heading, 12pt, bold type, centred

An automatic Cartesian grid generator is presented together with Euler solutions of flows around complicated geometries. The computational grid is generated based on an octree-data structure. Solid bodies merely blank out areas of the background Cartesian grid. The part of the surface-intersecting cells is cut off, which lies inside the body. As a result arbitrarily shaped cut-cells arise around the geometry. ...

--- Summary, 10 lines

2 Three-Dimensional Cartesian Grid Generation

--- Heading, 12pt, bold type, centred

The surface of the geometry is described in form of a surface triangulation, which is adapted to the local curvature radius. The triangulation requires the attribute of watertightness. Prior to the grid generation, the body is translated, rotated and

2.1 Spatial Decomposition of the Flow Domain

--- Sub-Heading, 10pt, bold type, placed to the left

The flow domain is represented in a Cartesian space, therefore the physical and the computational space are identical. At the beginning of the domain decomposition it consists of only one huge initial hexahedral cell. Now the flow domain is divided into smaller sub-domains using the octree-structure, [14] and [15]. The cells of the octree are identical to the Cartesian cells. ...

--- Citation of references

High values of entropy tend to indicate grid areas that are simply under resolved. For each cell, weighted forms of the divergence, τ_d, and curl, τ_c, of the velocity and the strength of the numeric entropy, τ_e, are computed:

--- Equations with punctuation marks and equation number

$$\tau_{d_i} = \left|\nabla \cdot \vec{\upsilon}_i\right| L_i^{3/2}, \ \tau_{c_i} = \left|\nabla \times \vec{\upsilon}_i\right| L_i^{3/2}, \ \tau_{e_i} = \left|\nabla_{p_i} - a_i^2 \nabla_{p_i}\right| L_i^{3/2}. \quad (1)$$

L_i is the length-scale for each cell, equation (1). The length-scale weight is used to find weaker features, which are in a coarser area of the flow. This allows the weaker features to be refined when the stronger features have been resolved, Figure 4.

--- Citation of equation

--- Citation of figure

Acknowledgement(s)

--- Acknowledgement(s),12pt bold type, centred

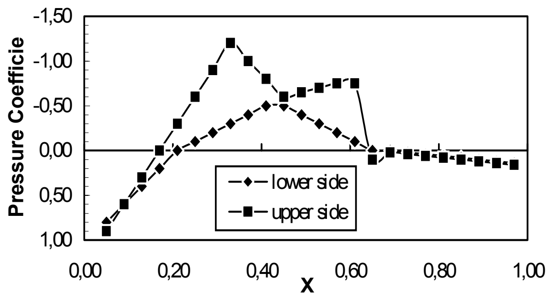
The authors would like to thank the CNRS and the DFG for grants under which the project "Self-Organizing Cartesian Grid-Generation System" is supported, embedded in the French-German project "Numerische Strömungssimulation – Simulation Numérique d'Ecoulements".

References

--- References, 12pt, bold type, centred

[1] E.H. Hirschel and W. Schwarz. "Mesh Generation for Aerospace CFD Applications". In Surveys on Mathematics for Industry, Volume 4, 1995, pp. 249-265.

[2] S.L. Jr. Karman. "Unstructured Cartesian/Prismatic Grid Generation for Complex Geometries". In Surface Modeling Grid Generation and Related Issues in Computational Fluid Dynamics (CFD Solutions. NASA CP-3291, 1995, pp. 251-270.



--- Figure, centred, legibility of numbers and symbols!

Figure 15 Pressure coefficients of airfoil (M = 0.84, α = 3.06°)

--- Figure number (bold type), figure legend, all 9pt, centred

Table 1 Number of flow-cells and cut-cells for each multi-grid level

--- Table number (bold type), table legend, all 9pt, centred

Multigrid level	Number of flow-cells / Number of cut-cells		
	Initial grid	Adapted grid #1	Adapted grid #2
L_5	20745 / 7483	41234 / 1517	112294 / 22444
L_4	928 / 384	1308 / 684	828 / 508
L_3	3332 / 2320	12001 / 7686	6885 / 4689
L_2	10026 / 5122	17852 / 5312	56237 / 18359
L_1	4592 / 1328	8888 / 1328	40220 / 5312
L_0	1760 / 344	3632 / 344	15896 / 1328

--- Table with complete frame, centred