# Questionnaire summary

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Questionnaire summary
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# Questionnaire summary

- To describe the main characteristics of the methods used during this workshop,
- To identify new trends, new methods and/or common methodologies.

# Equations

| Method | # contributions | Comments |
|---|---|---|
| RANSE | 24 | |
| Hybrid RANSE/LES | 3 | IIHR, URO, FOI |
| LES | 2 | SRC, FOI |

# Coordinate transformation

| Method | # contributions | Comments |
|---|---|---|
| Cartesian velocity components | 35 | |
| Contravariant velocity components | 1 | MARIN/Parnassos |

# Turbulence model

| Method | # contributions | Comments |
|---|---|---|
| One equation linear | 2 | INSEAN, MARIN (Parnassos) |
| Two equations linear (k-ω SST) | 20 | |
| Two equations linear (k-ε RNG) | 5 | |
| EASM non-linear | 4 | |
| RSM | 1 | HHI |
| Hybrid LES | 4 | IIHR(2 codes), FOI, URO |
| LES | 2 | FOI, SRC |

# Free-surface treatment

| Method | # contributions | Comments |
|---|---|---|
| VOF, Interface capturing | 20 | |
| Level set | 5 | |
| Interface | 1 | |

# Force integration

| Method | # contributions | Comments |
|---|---|---|
| Body surface integration | 20 | |
| Fluid momentum balance | 1 | HHI (StarCCM+) |

# Solid motion description

| Method | # contributions | Comments |
|---|---|---|
| Euler angles | 10 | |
| Quaternions | 16 | |

# Temporal discretization

| Method | # contributions | Comments |
|---|---|---|
| Euler explicit | 3 | |
| Euler implicit | 16 | |
| 3 points backward | 2 | |
| R | 2 | UniZag |
| M | 1 | SRC/LES |

# Grid motion

| Method | # contributions | Comments |
|---|---|---|
| Overall motion | 9 | |
| Overset | 7 | |
| Grid deformation | 9 | |
| Regridding | 1 | |

# Grid software

| Method | # contributions | Comments |
|---|---|---|
| In house | 4 | |
| Hexpress | 9 | |
| Icem CFD | 3 | |
| Gambit | 1 | |
| StarCCM+ | 5 | |
| Gridgen | 3 | |
| Pointwise | 5 | |
| OpenSource | 2 | UniZag |
| Up-Grid | 1 | NMRI, Japan |
| Snappy | 2 | |

# Grid type

| Method | # contributions | Comments |
|---|---|---|
| Overlap | 5 | |
| Structured | 3 | |
| Unstructured | 20 | |

# Discretization method

| Method | # contributions | Comments |
|---|---|---|
| Finite Volume | 23 | |
| Finite Difference | 2 | |
| Finite Element | 1 | SRC (P1) |

# Convective terms discretization

| Method | # contributions | Comments |
|---|---|---|
| Upwind/Hybrid | 32 | |
| Centered | 1 | SRC |
| Roe with flux correction | 1 | Chalmers/Shipflow |

# Linearization

| Method | # contributions | Comments |
|---|---|---|
| Picard | 17 | |
| Newton | 7 | ? |
| Quasi-Newton | 4 | |

# Pressure/velocity coupling

| Methods | # contributions | Comments |
|---|---|---|
| Segregated pressure correction | 31 | |
| Artificial compressibility | 4 | |
| Fully coupled | 1 | MARIN/Parnassos |
| Low compressibility | 1 | SRC |

# Linear solvers

| Methods | # contributions | Comments |
|---|---|---|
| Krylov | All | |
| Multigrid | 0 | Algebraic multigrid solvers |

# Acceleration techniques

| Methods | # contributions | Comments |
|---|---|---|
| Multigrid | 7 | |

# Architecture

| Methods | # contributions | Comments |
|---|---|---|
| MPI | 29 | |
| Shared | 3 | |
| Vectorial | 0 | |
| Workstation | 3 | |

**Thank you for your attention !**