

Application of sparse matrices and H-matrices at EADS Innovation Works

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Abstract

EADS Innovation Works is EADS corporate research center, dedicated to upstream work that are targeted for usage in all Business Units (Airbus, Eurocopter, Astrium and Cassidian). In the Applied Mathematics team, we have a strong competency in the field of Integral Equations applied mainly to electromagnetism and acoustics. During the solstice ANR project, we have integrated the mumps library in these simulation tools, in order to solve efficiently a FEM/BEM (Finite Element Method/ Boundary Element Method) coupling scheme in the field of electromagnetism. Recently, we have used the same numerical model in the field of aeroacoustics, to simulate the propagation of acoustic waves in non-uniform air flows. During this talk, we will present this application based on the mumps library. We will also present recent works on H-matrix solver, that we use mainly to deal with dense systems, but it could handle sparse matrices as well. This kind of work is in progress on mumps, this will be an opportunity to discuss the matter.