ExtendableFEM.jl and the WIAS-PDELib ecosystem in julia

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Lecture of

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The talk presents a collection of open source PDE solvers written in Julia that are part of the GitHub organization WIAS-PDELib.

It features the finite element module ExtendableFEM.jl, the finite volume module VoronoiFVM.jl and the grid manager ExtendableGrids.jl, as well as tools for grid generation, visualization, and application packages. The shared grid management in particular allows a seamless combination of structure-preserving finite element and finite volume methods to create physically consistent solvers for certain coupled PDE systems. The talk gives some short demonstrations and discusses highlights from scientific projects at WIAS including semiconductors, quantum devices, computational fluid dynamics and heterogeneous catalysis.