Using Modern C++ Idiom for the Discretisation of Sets of Coupled Transport Equations in Numerical Plasma Physics[1] JAN VAN DIJK, BART HARTGERS, JOOST VAN DER MULLEN, Eindhoven University of Technology — Self-consistent modelling of plasma sources requires a simultaneous treatment of multiple physical phenomena. As a result plasma codes have a high degree of complexity. And with the growing interest in time-dependent modelling of non-equilibrium plasma in three dimensions, codes tend to become increasingly hard to explain-and-maintain. As a result of these trends there has been an increased interest in the software-engineering and implementation aspects of plasma modelling in our group at Eindhoven University of Technology. In this contribution we will present modern object-oriented techniques in C++ to solve an old problem: that of the discretisation of coupled linear(ized) equations involving multiple field variables on ortho-curvilinear meshes. The 'LinSys' code has been tailored to the transport equations that occur in transport physics. The implementation has been made both efficient and user-friendly by using modern idiom like expression templates and template meta-programming. Live demonstrations will be given. The code is available to interested parties; please visit www.dischargemodelling.org.

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