A three-equation bypass transition model based on the intermittency function[1] XUAN GE, PAUL DURBIN, Iowa State University — An intermittency model that is formulated in local variables is proposed for representing bypass transition in Reynolds-Averaged Navier-Stokes (RANS) computations. No external data correlation is used to fix transition. Transition is initiated by diffusion and a source term carries it to completion. A sink term is created to predict the laminar region before transition and vanishes in turbulent region. For validation of this model, a group of test cases based on flat plate experiments have been set up for numerical simulations in OpenFOAM. It turns out that the current model is capable to predict boundary layer transition on a flat plate both with and without pressure gradients. Decent agreement with the available experiment data is observed.

Xuan Ge
Iowa State University

Electronic form version 1.4