

This thesis studies the numerical solution of non-linear convection-diffusion problems using the space-time discontinuous Galerkin method, which perfectly suits the space as well as time local adaptation. We aim to develop a posteriori error estimates reflecting the spatial, temporal, and algebraic errors. These estimates are based on the measurement of the residuals in dual norms. We derive these estimates and numerically verify their properties. Finally, we derive an adaptive algorithm and apply it to the numerical simulation of non-stationary viscous compressible flows.