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**Runge-Kutta-Chebyshev Projection Method**[1] ZHEMING ZHENG, LINDA PETZOLD, Mechanical Engineering, University of California Santa Barbara — In this work a fully explicit, stabilized projection method called the Runge-Kutta-Chebyshev (RKC) Projection method is presented for the solution of incompressible Navier-Stokes systems. This method preserves the extended stability property of the RKC method for solving ODEs, and it requires only one projection per step. An additional projection on the time derivative of the velocity is performed whenever a second order approximation for the pressure is desired. We demonstrate both by numerical experiments and by order analysis that the method is second order accurate in time for both the velocity and the pressure. Being explicit, the RKC Projection method is easy to implement and to parallelize. Hence it is an attractive candidate for the solution of large-scale, moderately stiff, diffusion-like problems.

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