

# **Asymptotic Behavior of Solutions to Rosenau–Burgers Equation with Periodic Boundary Condition**

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This study focuses on the generalized Rosenau–Burgers equation

$$u_t + u_{xxxxt} - au_{xx} + f(u)_x = 0$$

with periodic boundary condition. It is proved that with smooth initial value the global solution uniquely exists. Furthermore, for  $a > 0$ , the global solution converges time asymptotically to the average of the initial value in an exponential form, and the convergence rate is optimal; while for  $a = 0$ , the unique solution oscillates around the initial average all the time. Finally, numerical simulations are reported to confirm the theoretical results.