

1133-35-239

Ugur G. Abdulla and **Habeeb Aal Rkhais*** (haalrkhais2014@my.fit.edu). *On the Qualitative Theory of the Nonlinear Degenerate Parabolic Equations of the Reaction-Diffusion-Convection Type.*

We apply the methods developed in papers *U.G. Abdulla, J. Diff. Eq., 164, 2000, 321-354*; *U.G. Abdulla & J.King, SIAM J. Math. Anal., 32, 2(2000), 235-260*, to solve the problem on the initial development and asymptotics of the interfaces and local solutions near the interfaces for the reaction-diffusion-convection equation

$$u_t - (u^m)_{xx} + a(u^\gamma)_x + bu^\beta, \quad m > 1, \gamma, \beta > 0, a, b \in \mathbb{R}$$

with compactly supported initial function. Depending on the relative strength of three competing forces such as diffusion, convection, and reaction, the interface may expand, shrink or remain stationary. We pursue full classification of the asymptotics of the interfaces and local solutions in terms of parameters $m, \gamma, \beta, \text{sign } a, \text{sign } b$. The methods used are rescaling and blow-up techniques for the identification of the asymptotics of the solution along the class of interface type curves, construction of the barriers and application of the comparison theorem in non-cylindrical domains with characteristic boundary curves. (Received July 27, 2017)