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**Hermann J Eberl.** *A new approach to substrate flux approximation for Monod boundary value problem arises in the study of biofilms.*

We present an analytical approximation for the diffusive flux of a substrate into a reactive layer, in which the substrate is degraded according to Monod kinetics. This problem is described by a nonlinear two-point boundary value problem. The approximation is derived from Modified Adomian Decomposition Approach for boundary value problems and verified computationally, by comparison against a numerical solution of the problem. The analytical approximation is easy to evaluate and depends only on model parameters. It is shown that the approximation simplifies the study of biofilm reactor model arises in the waste water engineering. (Received September 15, 2019)