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The Fisher's equation is established combining the Fick's law for the flux and the mass conservation law with a reaction term evaluated at the present time. If this term depends on the solution at some past time, a delay parameter is introduced and the delay Fisher's equation is obtained. Modifying the Fick's law for the flux considering a time memory term, integro-differential equations of Volterra type are established.

In this work we study reaction-diffusion equations obtained combining the two modifications: a time memory term in the flux and a delay parameter in the reaction term. The delay integro-differential equations also known as delay Volterra integro-differential equations, are studied in the theoretical view point: stability estimates are established. Numerical methods which mimic the theoretical models are analysed. Numerical experiments illustrating the established results are also included. (Received September 16, 2008)