5007-41-143 **Inti Pineda*** (inti@xanum.uam.mx), Av. San Rafael Atlixco 186, Col. Vicentina, 09340 Mexico City, D. F., Mexico, and **Leonardo Dagdug** (dll@xanum.uam.mx), Av. San Rafael Atlixco 186, Col. Vicentina, 09340 Mexico City, D. F., Mexico. *Mapping of diffusion in two-dimensional narrow asymmetric channels.*

Diffusive transport of particles or small objects is a ubiquitous feature of physical, chemical and biological systems. Typical structures like pores, tubes or fibers, are quasi one-dimensional. We have to solve $3+1$ or $2+1$ dimensional differential equations to describe correctly transport along them. The so-called Fick-Jacobs approach dramatically simplifies the problem if one assumes that solute distribution in any cross-section of the channel is uniform as at equilibrium. This study focuses on the mapping of the diffusion equation in a two-dimensional narrow asymmetric channel of varying cross section onto the longitudinal coordinate. We present a rigorous mapping technique generating systematically corrections to the spatial operator of this equation in a small parameter $\lambda = D_x/D_y$, according to the projection method introduced earlier by Kalinay and Percus. We derive an expansion of the effective diffusion coefficient $D(x)$ which represents corrections to the Fick-Jacobs equation and contains the well-known previous results as special cases, namely, those obtained by Yariv *et al.*, Bradley, and more recently by Berezhkovskii and Szabo. (Received May 02, 2013)