Around permanent regime

Valves (or barriers) are characterized by a width *w_b* and a permeability *k_b* 10–100 times lower than background.

A permanent regime can be described if the valves do not open/close. We use it to study in a controlled manner how p transient affect neighboring valves.

We are able to theoretically derive pore pressure profiles (and thus equilibrium flux) in stationnary regime for an arbitrary distribution of N valves, with varying widths and permeability, in 2 boundary conditions settings for now: *(a)* fixed pressure on both sides of the domain, and *(b)* fixed flux on the deep end, fixed pressure on the shallow end.

Around permanent regime

(a) PP boundaries: equilibrium

The differential of pressure imposed by the boundary conditions is distributed on barriers and background segments according to their width and permeability. If:

L_barriers/k_barriers >> L_background / k_background,

then, the total differential of pressure can be assumed to be mostly accommodated at barriers, likewise, the equilibrium flux is mostly dictated only by barriers length and permeability (cf Shapiro et al. 2018), similar derivation.