Around permanent regime

(a) PP boundaries: equilibrium

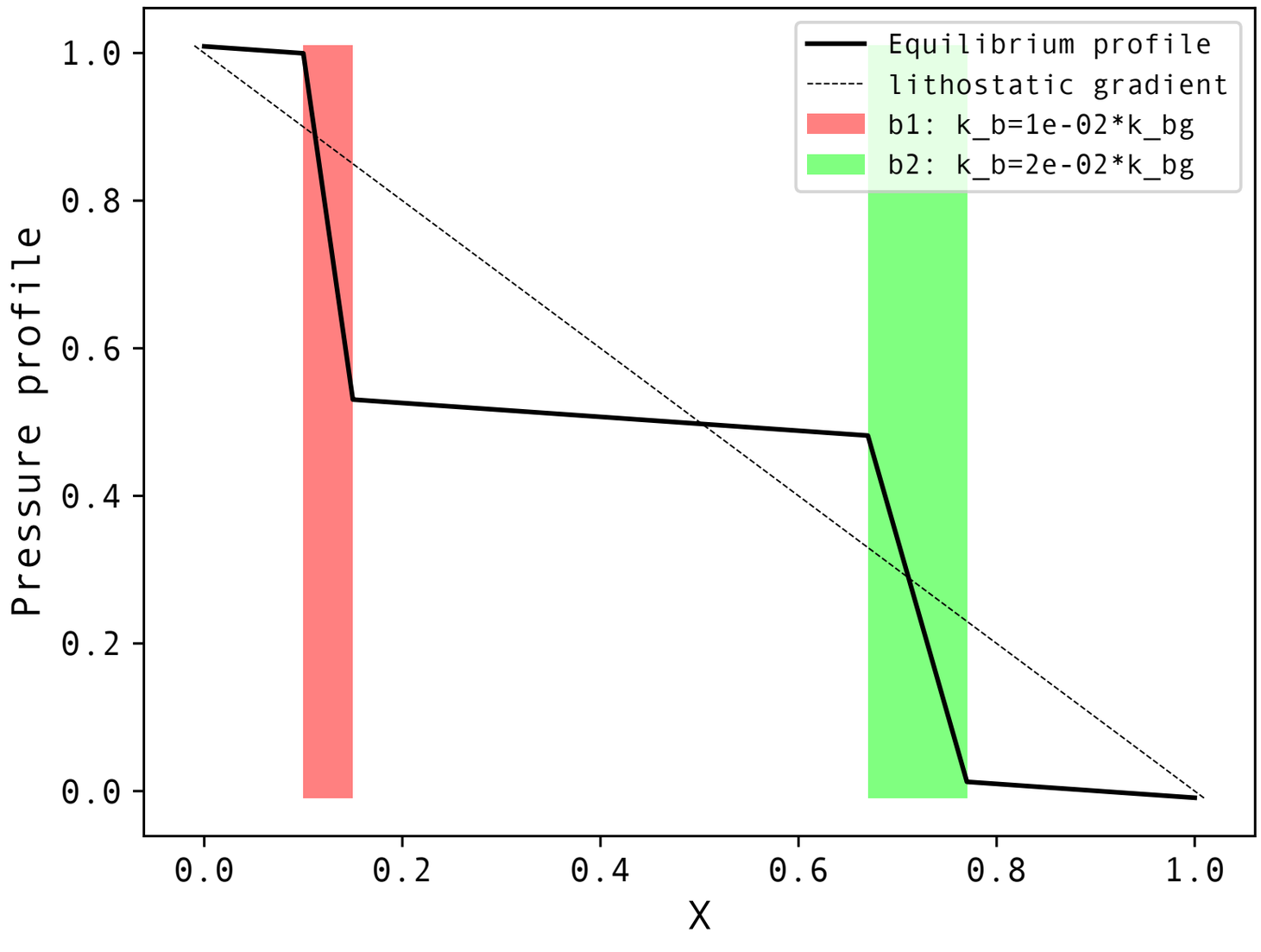
In the case where N barriers of width *w_b* and permeability *k_b* are prevalent in the permanent regime, the equilibrium flux *q* can be written as:

*q = dP_tot * k_b / mu / (N*w_b)*

and we can derive an equivalent permeability for the whole domain:

k_eff = k_b * L_domain / (N*w_b)

In the case of dynamic (opening/ closing) valves, effective *k_b* and *w_b* could be determined, and used in the previous formulas. Both would be linked to the period of loading and unloading of the valve. This remains to be derived.



Around permanent regime

(a) PP boundaries: transient from valve breaking

Experiment:

- Init. equilibrium pore-pressure profile when 2 valves are closed, but valve nb1 is open (k_b = k_bg).
- Observe the propagating transient

Observation:

- transient progresses from one valve to the other, to redistribute total dP on background segments and barriers.
- dP across remaining valve is increased (closer to failure?)
- overpressure (above lithostatic gradient) is increased (closer to failure?)

↓ this is a gif, click on it to play