Around permanent regime

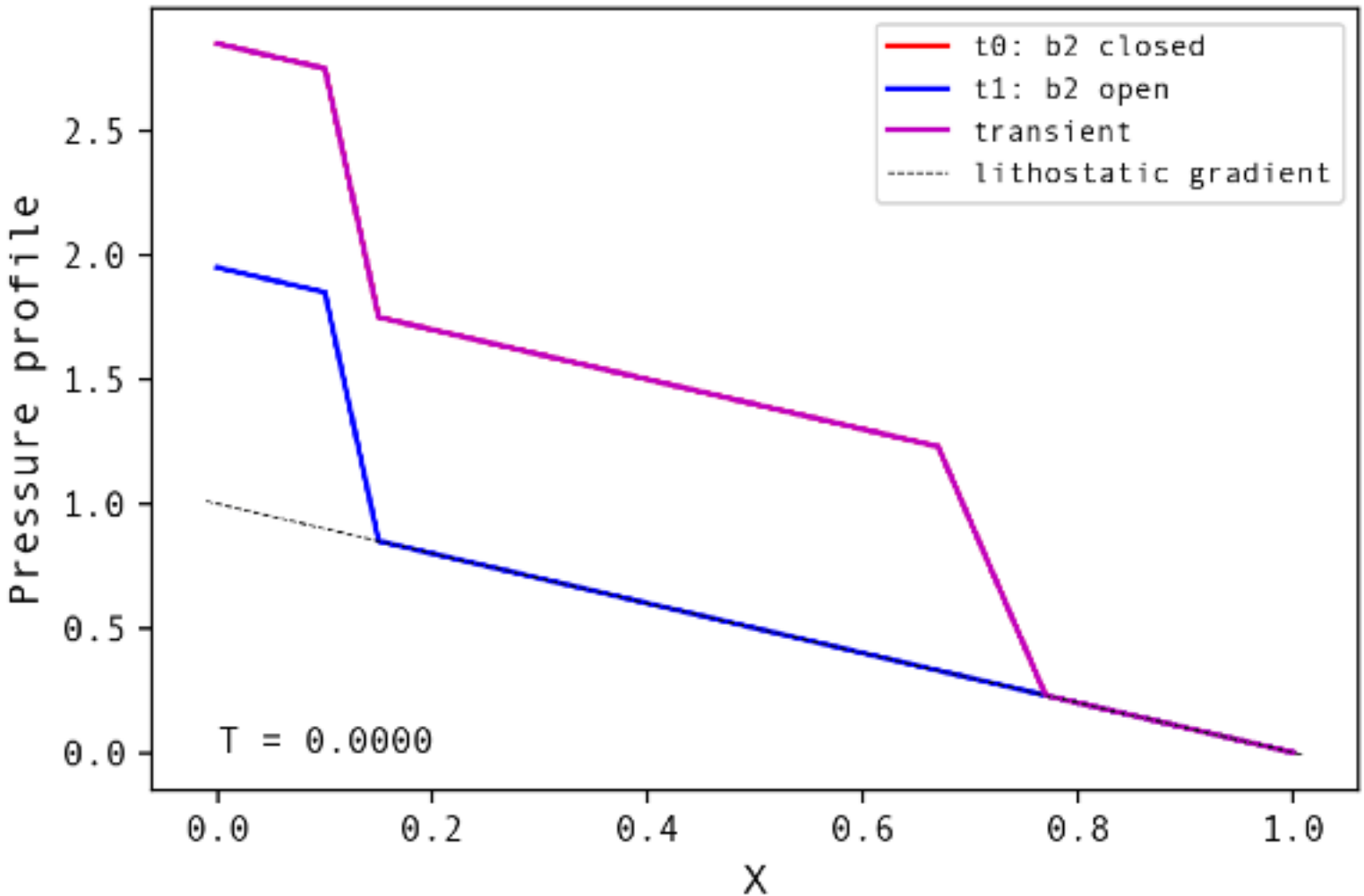
(b) QP boundaries: transient from valve breaking

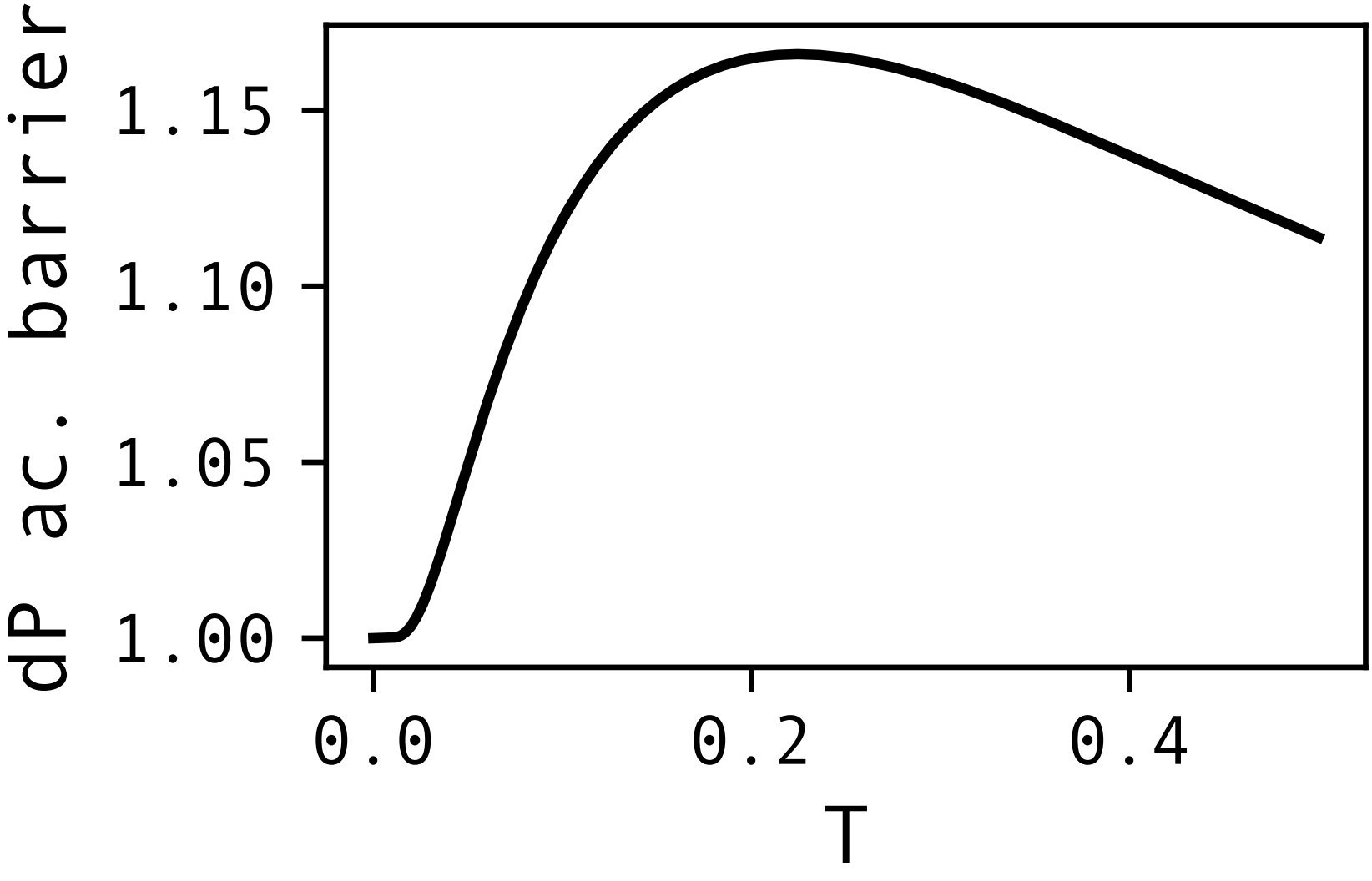
Experiment:

- Init. equilibrium pore-pressure profile when 2 valves are closed, but valve nb2 is open ($k_b = k_{bg}$).
- Observe the propagating transient

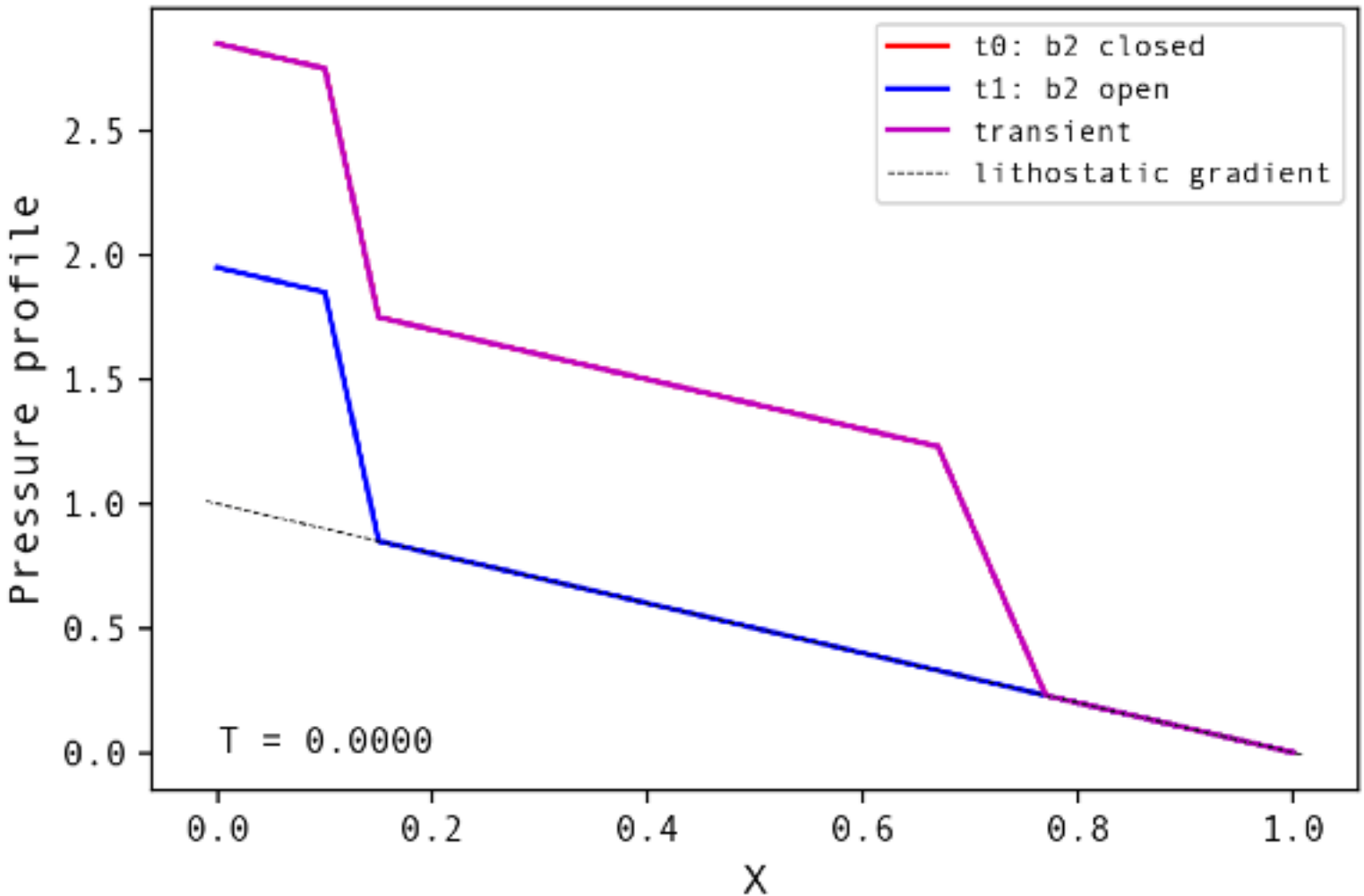
Observation:

- transient progresses from one valve to the other, to redistribute total dP on background segments and barriers.
- dP across remaining valve and overpressure are increased (closer to failure?)
- The increase is transient, overpressure will progressively dissipate when fluid has crossed the low permeability barrier


t0: b2 closed
t1: b2 open
transient
lithostatic gradient
Pressure profile
2.5
2.0
1.5
1.0
0.5
0.0
T = 0.0000
0.0
0.2
0.4
0.6
0.8
1.0
X


dP ac. barrier
1.15
1.10
1.05
1.00
0.0
0.2
0.4
T

this is a gif, click on it to play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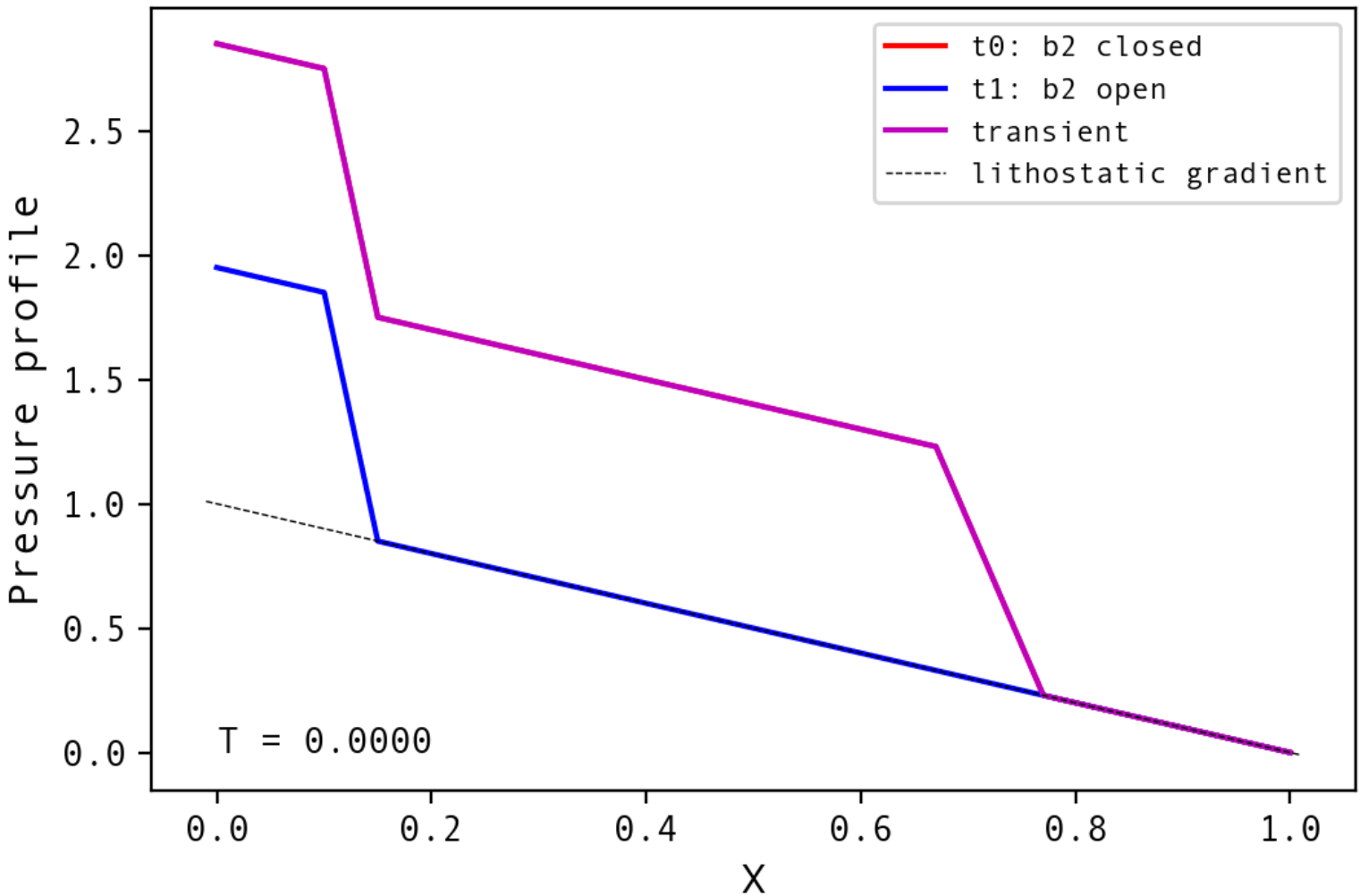
2.0
1.5
1.0
0.5
0.0
T = 0.0000
0.0
0.2
0.4
0.6
0.8
1.0
X


t0: b2 closed
t1: b2 open
transient
lithostatic gradient
Pressure profile
2.5
2.0
1.5
1.0
0.5
0.0
T = 0.0000
0.0
0.2
0.4
0.6
0.8
1.0
X

Around permanent regime

(b) QP boundaries: transient from valve breaking

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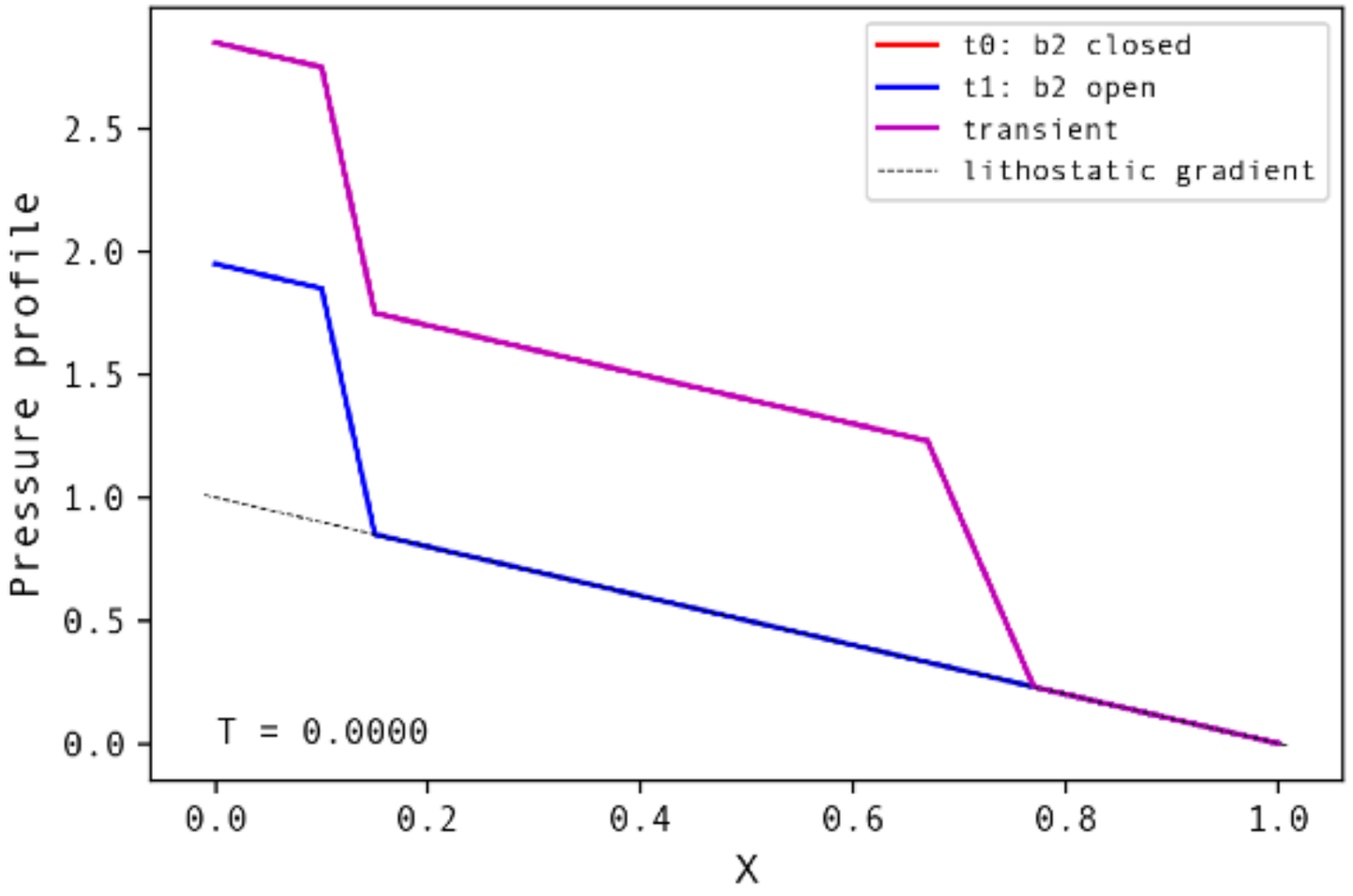
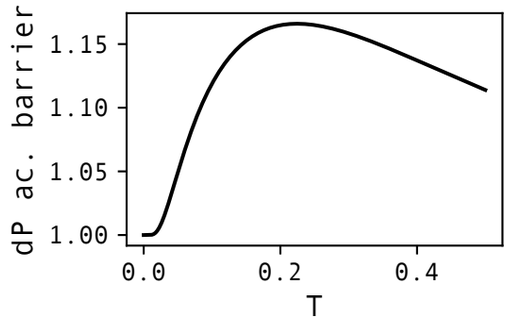




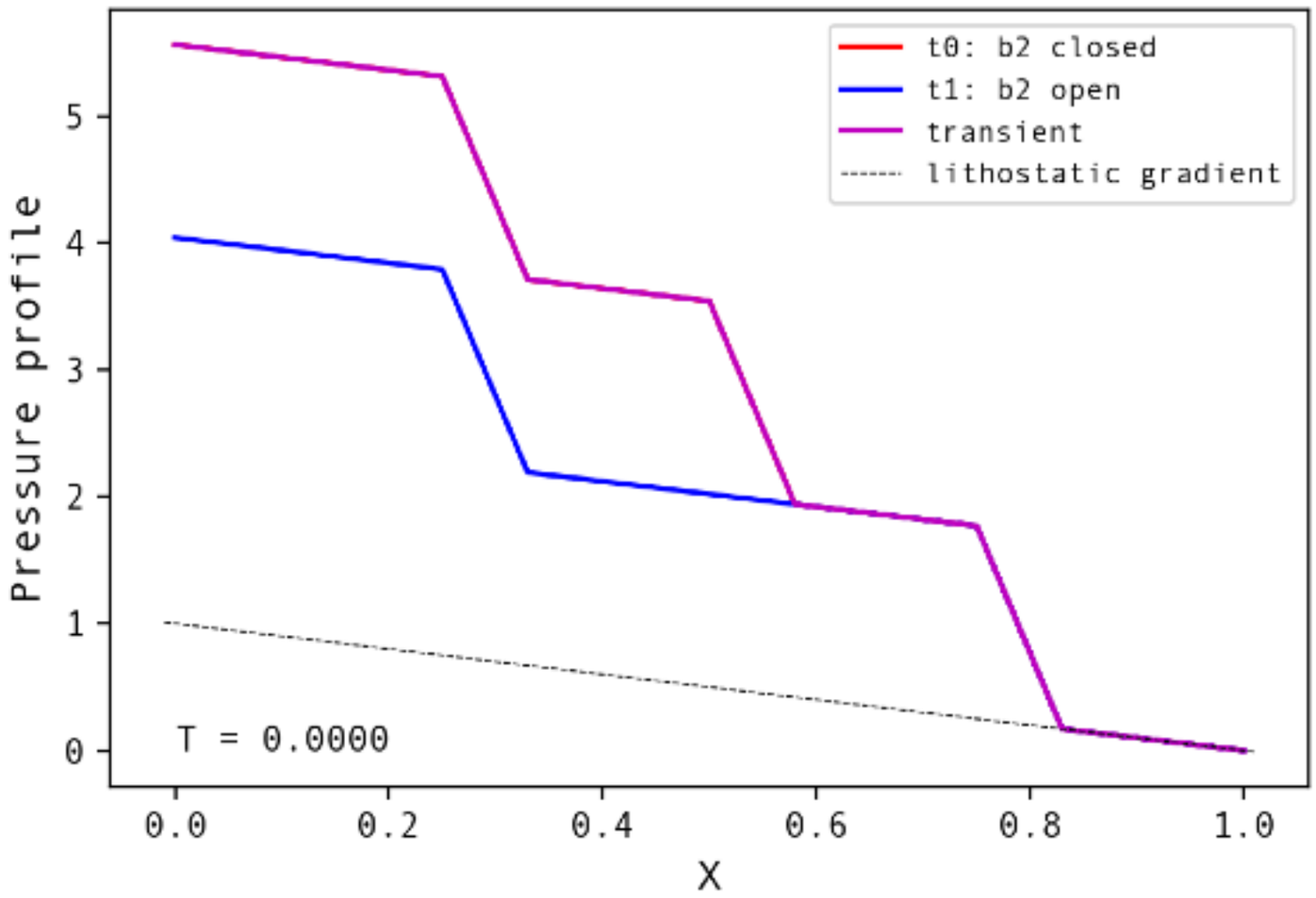
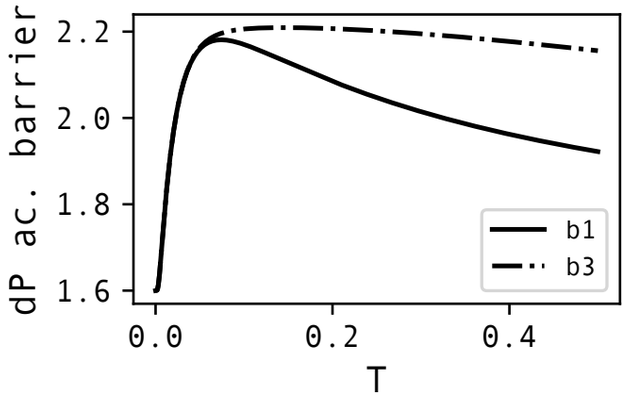
Around permanent regime

(b) QP boundaries: transient from valve breaking

↓ this is a gif, click on it to play

Experiment:

- Init. equilibrium pore-pressure profile when 3 valves are closed, but valve nb2 is open (k_b = k_bg).
- Observe the propagating transient

Observation:

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