# Parallel-Step Slider Bearing
(Lord Rayleigh's Slider Bearing)

Lord Rayleigh, as long ago as 1918, demonstrated that a parallel-step geometry produced the optimum load-carrying capacity when side leakage was neglected. This bearing has not, however, enjoyed the same development and applications as the pivoted-pad slider bearing. Past neglect of this mathematically preferable configuration has been due to doubts about the relative merits of this bearing when side leakage is considered.

Hypotheses :

    - continuous flow
    - Newtonian fluid $\rightarrow$ Reynolds equation
    - Thin film

    $\rho = \mathrm{cte}$, $\eta = \mathrm{cte}$, permanent regime, infinite length
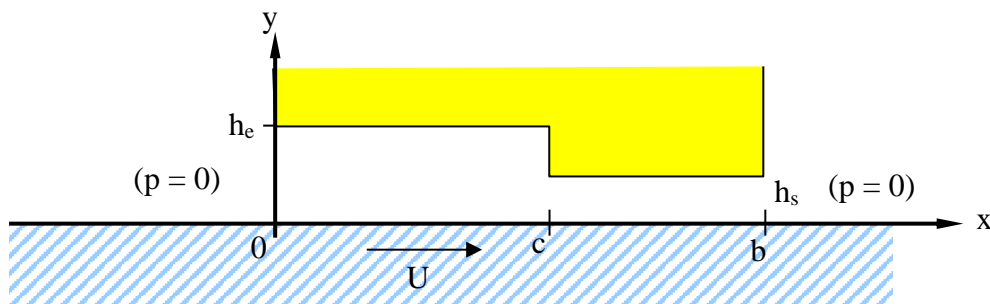
h_e : input film thickness
h_s : output film thickness

Results will be expressed as a function of parameters a and s defined as : $a = \dfrac{h_e}{h_s}$ et $s = \dfrac{c}{b}$.

1. **The simplified form of the Reynolds equation and subsequent pressure distribution**

2. **The fluid flux**

3. **The load-carrying capacity per unit length and the optimum value of a.**

4. **The friction force** at y = 0 and at y = h