**Fracture**

$\frac{∂c\_{f}}{∂t}=-u\frac{∂c\_{f}}{∂x}+D\_{f}\frac{∂^{2}c\_{f}}{∂x^{2}}+\left.D\_{p}ε\_{p}\frac{1}{b}\frac{∂c\_{p}}{∂z}\right|\_{z=b}$ (1)

**Porous rock matrix**

$\frac{∂c\_{p}}{∂t}=D\_{p}\frac{∂^{2}c\_{p}}{∂z^{2}}$ (2)

where the subscripts $f$ and $p$ refer to the fracture and pore space of the rock matrix, respectively; $x$ and $z$ are the coordinates along and perpendicular to the fracture plane, respectively; $t$ denotes the time; $c$ represents the concentration of the tracer; $D$ the coefficient of longitudinal dispersion in the fracture or the coefficient of pore diffusion in the homogeneous rock matrix; $u$ the groundwater velocity in the fracture; $ε$ the porosity; $b$the aperture.



The **coupling term** (the third term at right hand side in Eq. (1)) refers to **the diffusive flux at the interface between fracture and porous matrix**.