Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Eidgenössisches Departement des Innern EDI
Département fédéral de l'intérieur DFI
Dipartimento federale dell'interno DFI
Bundesamt für Meteorologie und Klimatologie MeteoSchweiz
Office fédéral de météorologie et de climatologie MétéoSuisse
Ufficio federale di meteorologia e climatologia MeteoSvizzera

$$C(z) = C_{sat} - (C_{sat} - C_0)\, erf\left(\frac{z}{\delta\sqrt{2}}\right)$$

$$\Rightarrow j(z)\Big|_{z=0} = -D\,\frac{d}{dz}\,C(z)\Big|_{z=0}$$

$$= +D\,[C_{sat} - C_0]\,\frac{d}{dz}\,\frac{2}{\sqrt{\pi}}\int_0^{z/\delta\sqrt{2}} e^{-t^2}\,dt$$

$$= +\frac{2D}{\sqrt{\pi}}\,[C_{sat} - C_0]\,\frac{d}{dz}\left[\frac{z}{\delta\sqrt{2}}\right] e^{-z^2/\delta^2\cdot 2}$$

(internal derivative)

$$\frac{d}{dx}\int_0^x f(t)\,dt = f(x)$$

$$\Rightarrow j(z)\Big|_{z=0} = \frac{2D}{\sqrt{\pi}}\,\frac{[C_{sat} - C_0]}{\delta\sqrt{2}}\, e^{-z^2/\delta^2\cdot 2}$$

$\delta \sim \sqrt{2Dt}$ (see later in lecture)

$$\Rightarrow j(z)\Big|_{z=0} = \frac{(C_{sat} - C_0)\sqrt{D}}{\sqrt{\pi}\sqrt{t}}\, e^{-(z/\delta\sqrt{2})^2}$$

$$\frac{kg}{m}\,\frac{m}{s^{1/2}\,s^{1/2}} = \frac{kg}{s}$$