$$F(t) = \int_0^t \frac{(t-s)^{\alpha}}{\Gamma(\alpha)} f(s)\, ds$$

Integralgleichung vom Faltungstyps

$$F(t) = \int_0^t (t-s)^{-\alpha} f(s)\, ds \qquad 0 < \alpha < 1$$

ABEL

$$f(s) = \frac{dg(s)}{ds}$$

$$F(t) = \int_0^t (t-s)^{-\alpha} \frac{dg(s)}{ds}\, ds$$

$$F(t) = t^{-\alpha} * \frac{dg(t)}{dt}$$

$$\bar{F}(t) = \frac{\Gamma(-\alpha+1)}{p^{-\alpha+1}} \left(p\,\varphi(p) - g(0)\right)$$

$$\mathcal{L}\frac{dg(t)}{dt} = \varphi(p)\cdot p - g(0)$$

$$\mathcal{L}\, g(t) = \varphi(p)$$

$$\varphi(p) = \frac{g(0)}{p} - \frac{\bar{F}(t)}{\Gamma(1-\alpha)\, p^{\alpha}}$$

$$g(t) = g(0) + F(t) * \frac{t^{\alpha-1}}{\Gamma(1-\alpha)\Gamma(\alpha)}$$

$$= g(0) + \frac{t^{\alpha-1} \sin \alpha\pi}{\pi} * F(t)$$