

$$\hat{f}(\nu) = \int_{\mathbb{R}} f(t) e^{-i2\pi\nu t} dt$$

$$(f * g)(t) = \int_{\mathbb{R}} f(y) g(t-y) dy$$

$$\hat{g}(\nu) = \int_{\mathbb{R}} g(t) e^{-i2\pi\nu t} dt$$

$$\hat{h}(\nu) = \int_{\mathbb{R}} h(t) e^{-i2\pi\nu t} dt$$

$$\widehat{f * g} = \hat{f} \cdot \hat{g}$$

$$\widehat{f * g}(\nu) = \hat{f}(\nu) \cdot \hat{g}(\nu)$$

$$L = \widehat{f * g}(\nu) = \int_{\mathbb{R}} \int_{\mathbb{R}} f(y) g(t-y) dy e^{-i2\pi\nu t} dt = \int_{\mathbb{R}} \int_{\mathbb{R}} f(y) g(t-y) e^{-i2\pi\nu t} dt dy =$$

$$= \int_{\mathbb{R}} f(y) \int_{\mathbb{R}} g(t-y) e^{-i2\pi\nu t} dt dy = \int_{\mathbb{R}} f(y) \int_{\mathbb{R}} g(\tau) e^{-i2\pi\nu y} e^{-i2\pi\nu \tau} d\tau dy =$$

$$= \int_{\mathbb{R}} f(y) e^{-i2\pi\nu y} dy \int_{\mathbb{R}} g(\tau) e^{-i2\pi\nu \tau} d\tau = \hat{f}(\nu) \cdot \hat{g}(\nu) = R$$