BIUNIVOCITÀ DELLA TCF

$$x(t) = \int_{-\infty}^{+\infty} X(f)\, e^{j2\pi ft}\, df$$

$$X(f) = \int_{-\infty}^{+\infty} x(t)\, e^{-j2\pi ft}\, dt$$

Dimostrazione

$$\int_{-\infty}^{+\infty} X(f)\, e^{j2\pi ft}\, df =$$

$$= \int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} x(\alpha)\, e^{-j2\pi f\alpha}\, d\alpha\; e^{j2\pi ft}\, df =$$

$$= \int_{-\infty}^{+\infty} x(\alpha) \int_{-\infty}^{+\infty} e^{-j2\pi f(\alpha - t)}\, df\, d\alpha =$$

$$= \int_{-\infty}^{+\infty} x(\alpha)\, \delta(\alpha - t)\, d\alpha = x(t)$$