
EXERCISE 7.4: Recall that $X(e^{j\hat{\omega}})$ defined in (7.2) is always periodic in $\hat{\omega}$ with period 2π . Use this fact and a change of variables to argue that we can rewrite the inverse DTFT integral with limits that go from 0 to 2π , instead of $-\pi$ to $+\pi$; that is, show that

$$\frac{1}{2\pi} \int_{-\pi}^{\pi} X(e^{j\hat{\omega}}) e^{j\hat{\omega}n} d\hat{\omega} = \frac{1}{2\pi} \int_0^{2\pi} X(e^{j\hat{\omega}}) e^{j\hat{\omega}n} d\hat{\omega}$$

