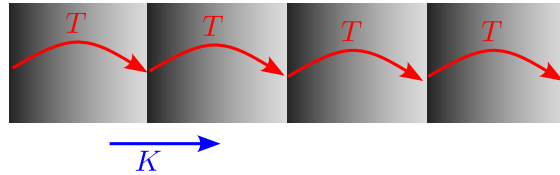# Dispersion equation in a periodic array.

FIG. 1 Periodic array of identical scatterers. Each scatterer is characterized by a transfer matrix T.

We consider wave propagation in a one-dimensional periodic structure, shown in Fig. 1. Wave scattering on each period is characterized by the 2×2 transfer matrix T with $\det T = 1$. We are interested in the propagating Floquet-Bloch solutions with the wave vector K, that satisfy $T\psi = e^{iK}\psi$.

Goal: Find the dispersion equation, that is express $\cos K$ via the transfer matrix elements.