autocorrelation function (acf)

- describes the linear statistic dependence of two values of a one random ~~fac~~ function $x(t)$ with the time difference τ

$$\Psi_{xx}(\tau) = \lim_{T \to \infty} \frac{1}{T} \int_T x(t)\, x(t+\tau)\, dt = E\{x(t)\, x(t+\tau)\}$$

- acf is good for detecting periodicity in a signal

- even and periodic
- for $\tau = 0$ (no time difference) $\Psi_{xx}(\tau=0)$ conforms the average power $E\{x^2(t)\}$.
- phase information dissapears

~~exa~~

example