

We report on an extensive study on light propagation in Fibonacci quasicrystals, with special focus on the optical states around the fundamental band gap of the structure. The samples are fabricated using free-standing porous silicon and experiments are performed using an ultrafast time-resolved transmission technique. Large pulse delays and pulse stretching are observed when exciting the band edge states of the Fibonacci structure. We carefully describe the various details concerning sample preparation and optical experiments. In particular, we highlight how optical path gradients related to technical limitations of the standard sample fabrication technique are responsible for a spatial confinement and intensity reduction of the narrow band edge states. However, band edge related pulse delay and stretching effects can still be observed experimentally in the time domain because the characteristic features originating from the quasiperiodic order are preserved. Experiments and numerical calculations are in good agreement.