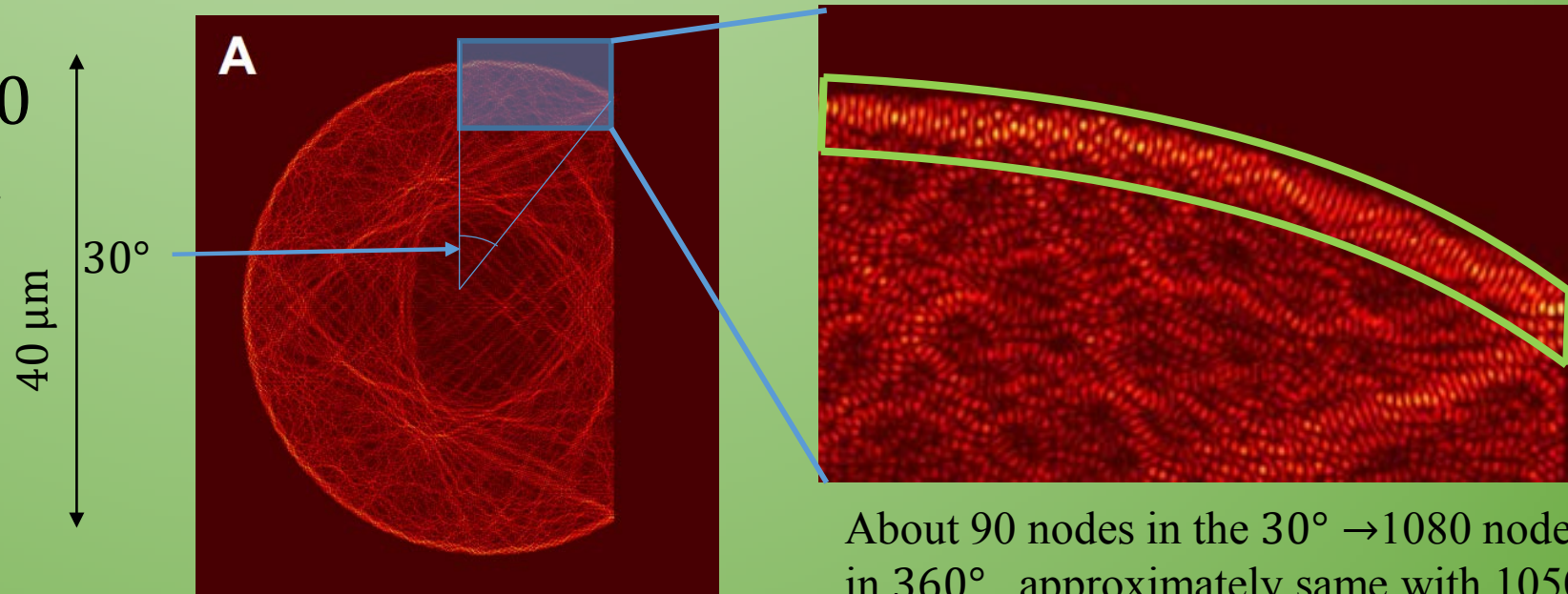# Q & A

Q1. How can the stationary mode pattern(of D-cavity) be thread-like pattern?

A. The size parameter of the mode is very large. The grain size is $\frac{\lambda}{2n} = 120 \text{ nm} = 2\pi * 20 \text{ μm} * (1/1050), \text{ nkR} \simeq 530.$ The modes are computed from $[\nabla^2 + n^2 k^2]H_z = 0$ with outgoing B.C. (using COMSOL)

40 μm

30°

A

About 90 nodes in the 30° →1080 nodes in 360° , approximately same with 1050

Q & A

Q2. How can the directionality emerge from 1D dielectric slab cavity?

A. 1D dielectric slab cavity has a preferred direction along its x-axis due to its geometry(z component of the wave vector is much smaller compared to the x component). Thus the wave feels fluctuations of the refractive index along its travel path and as a result has random phase, which lead to the directional stable lasing along x direction.
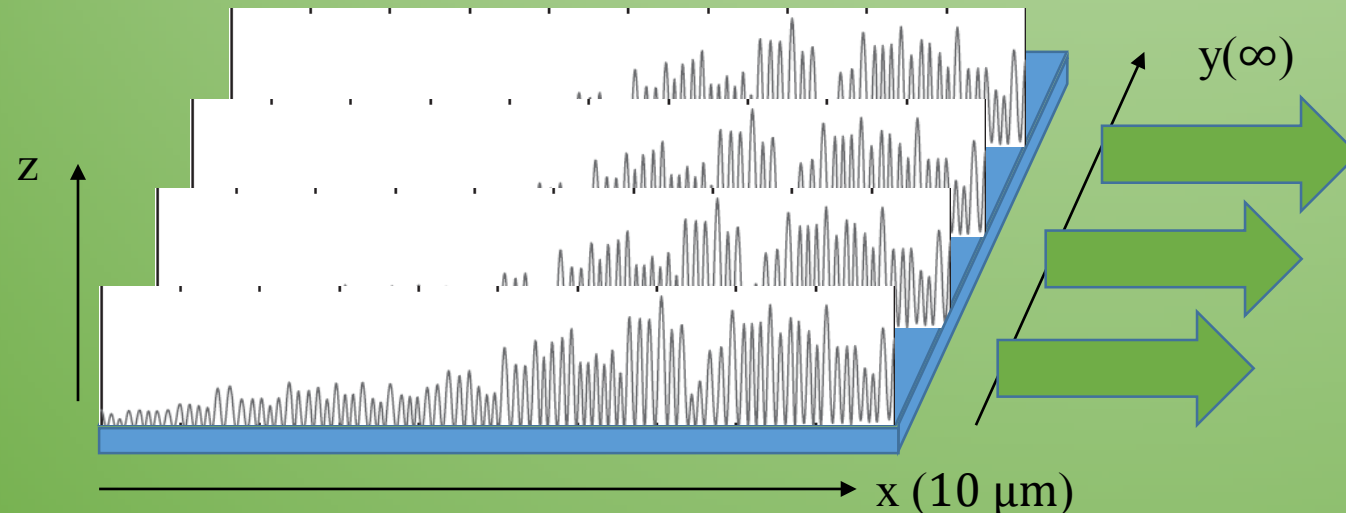
Q & A

Q3. How can the spatial hole burning be removed?

A. In my opinion(I could not find direct answer from the source), they(D-cavity, 1D disordered cavity) lack of well defined nodes in the envelope of the intensity distribution due to the random phase interference, thus the spatial hole burning is reduced compared to the regular *Fabry-Perot* cavity.