5. Future prospects

In future work, the transfer of excitation between different disks will be investigated. Amongst other fabrication imperfections, the ability of the neuron to react on the phase of the input pulses, makes larger microdisk networks sensitive to phase errors. Consequently, even though an integrated platform intrinsically limits the variable phase noise, one still needs a reliable, power efficient way to compensate for fixed phase offsets in large microdisk network.

6. Conclusions

Optically injected microdisk lasers can exhibit class I excitability. With the right geometry, this excitability mechanism can be addressed. The excitability mechanism shows similar properties to equivalent class I excitability found in biological neurons. Other properties, such as strong influence of optical phase, however, have no equivalent in biological or electrical systems, though they greatly influence the behavior of this specific excitability mechanisms. In the presented geometry, both output and input are signals with relatively strong power pulses on a small background signal. The similarity between input and output is expected to make excitation transfer between different disks possible.

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