New ideas for the Mosquito SS4

[Tibi 03 Sept. 2014]

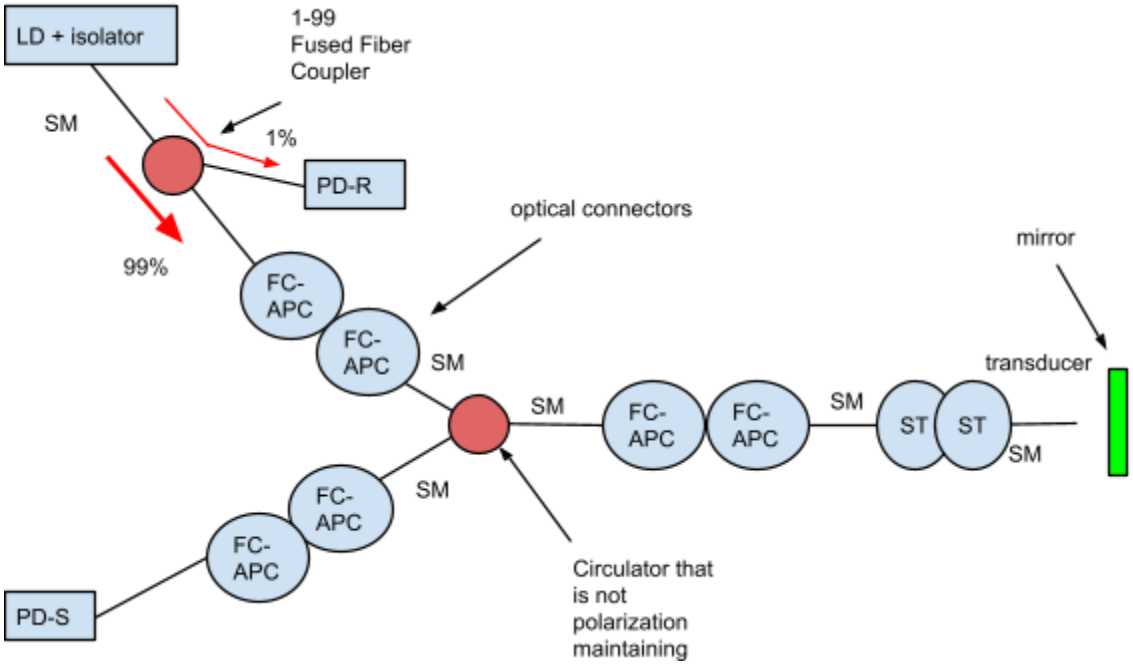
After a conversation with Francois Gonthier, 03 Septembre 2014.

Our last experiments with the Mosquito SS4 show that the laser becomes unstable as soon as there is a reflection from the transducer (semitransparent mirror).

The problem is that the transducer part doesn't maintain the polarization. Moreover, bending the fiber also changes the polarization. The circulator, is made for a particular polarization. If we change the polarization in the transducer more light will escape towards the laser, which makes it unstable. Moreover, the intensity variation at the Signal photodiode is a result of laser power variation, transducer power loss due to bending, and transmission variation through the PM fiber and the circulator due to the change in polarization. It is a complex signal.

Since bending the fiber changes polarization, that change might vary according to the bending direction.

One solution is to try a SM (single mode) system with a circulator that is not polarization dependent, with APC connectors everywhere. Moreover, the laser should have an isolator. This system is a bit less expensive, but should work according to Francois.



This requires a 500$ investment.

Another proposition is to continue the development of the LED Mosquito. For better coupling between the LED and the optical fiber system we can use a n-to-1 coupler (n can be 2,3...), bundle the n fibers and place them in front of the LED to increase the coupling surface. This would give us more light and the system is inherently immune to back reflections.
This requires 50 to 100$ investment.

Possible problems explained.