**Focus Measurement for the Fore-optics of CHAI**

The fore-optics of the CHAI receiver is used to converge the output beam of the SIS mixer and match the receiver beam to the required telescope illumination angular range. Since the pixel spacing is 10mm which is fixed by the mixer Mechanical design, the modification of the mixer beam changes the ratio of pixel spacing () and the reciver beam waist () that is related to the ratio of telescope beam spacing () on the sky to the beam angular size ().

The fore-optics uses the Cassegrain layout (**Fig.1**), one ellipsoid reflector and a hyperboloid mirror, to individually convert 0.916mm beam waist of the mixer to 3.5838mm for each pixel at 475GHz. So and are:

A red pipe with brown and tan background

Description automatically generated with medium confidenceA diagram of a graph

Description automatically generated with medium confidence

**76.82**

Gaussian optics design of the

To get the best focused telescope beam, the beam waist of the Mixer horn must sit in the designed input beam waist of the fore-optics. But