

During this week I read some papers and a master thesis about the liquid lenses to improve my knowledge about it. A brief introduce of these lenses are presented.

Weakness of DEA-tune liquid lens:

- High driving voltage requirement
- Limited focus distance
- Membrane puncture
- High stress

There are two types of integrated DEA:

- The first type has annular DEA radially stretching a tunable lens at the center. (This type indirectly reduces stress in the lens membrane)
- The second type has DEA integrated on the lens membrane which directly reduces stress in the lens membrane.

Limitation:

- The lens membrane under high Maxwell stress is susceptible to puncture at the bulged lens.
- A good actuator design requires the acrylic elastomer be highly pre stretched, but it sometimes could be cloudy and not homogenous for optical transmission.

Future work

- Miniaturize the prototype.
- Reduce the driving voltage.

I also wrote a conference paper to submit on The IEEE International Conference on Aerospace Electronics and Remote Sensing Technology 2014.