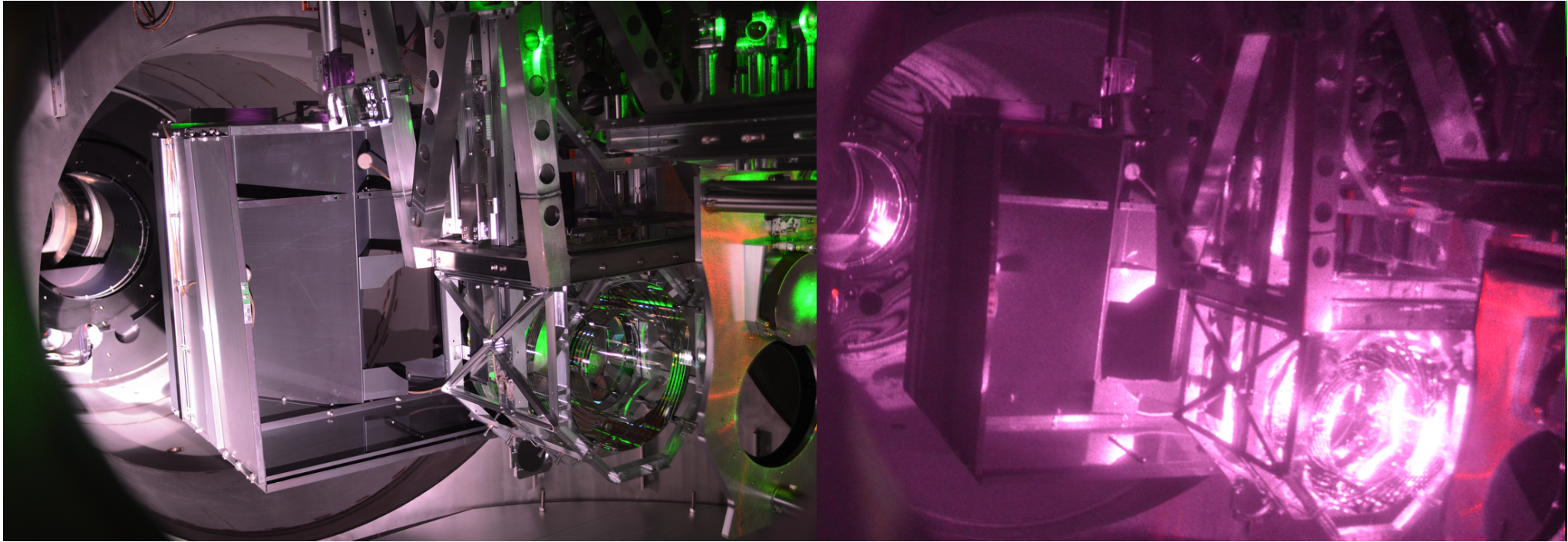


**LHO ETMY during green lock acquisition and locked in infrared with gravitational wave sensitivity (no extra illumination).**





One possibility is that the fringes are produced by light diffracted by ITM beam spot and scattered by the ETM. Using  $x = l/d \lambda$ :  $x$  is roughly 0.1 m, if  $l$  is about 4000 m,  $d = 4000/0.1 \times 1e-6 = 0.04$ , about the beam spot radius.

Likely a barrel reflection of light reflecting off of this part of the Cryobaffle. Beam-spot perspective photos show that this light should not be seen by TM

optical lever red light

Edge of ACB "shadow"

Arm Cavity Baffle (ACB)

Annular reaction mass - see close-up

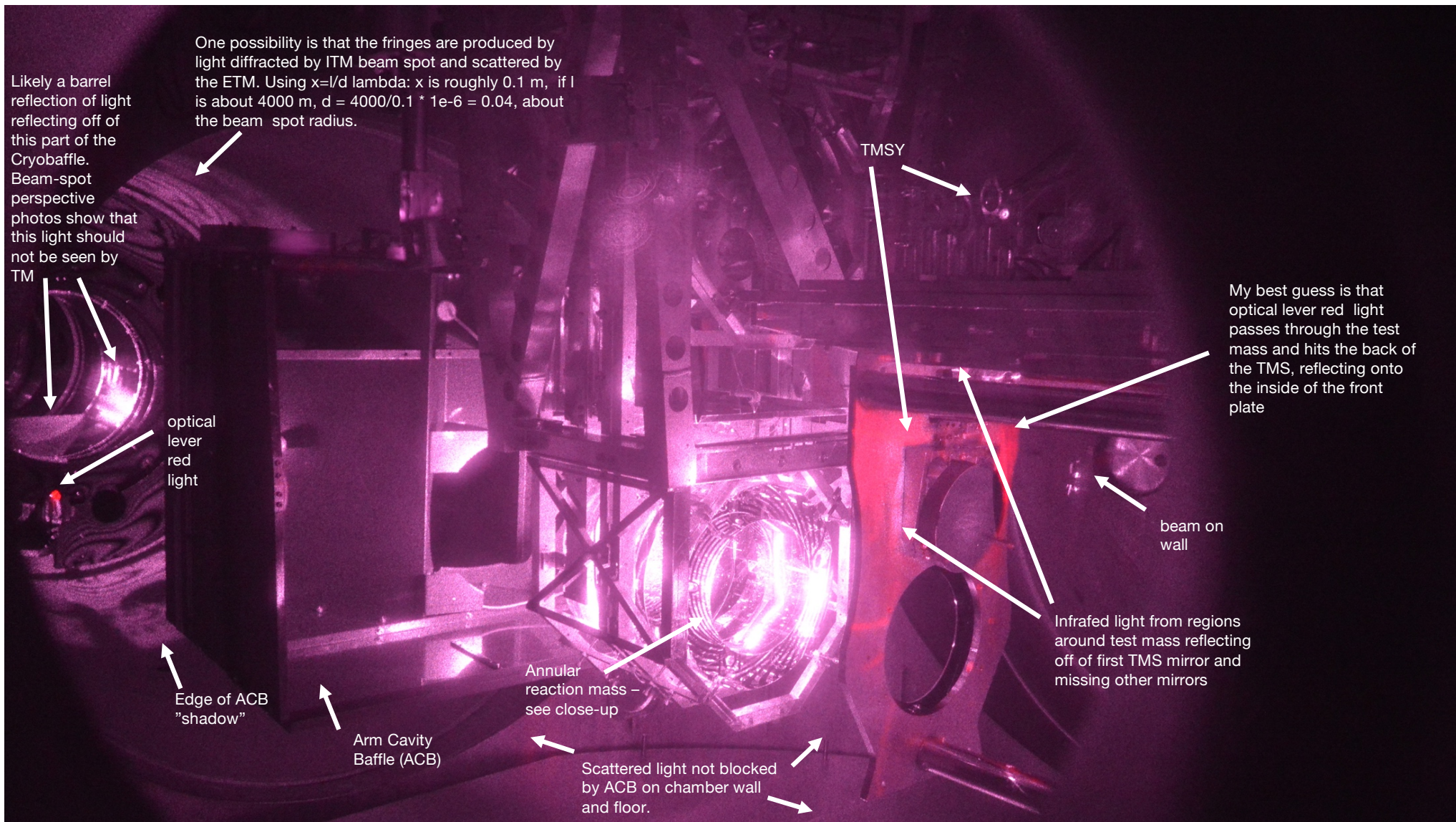
Scattered light not blocked by ACB on chamber wall and floor.

TMSY

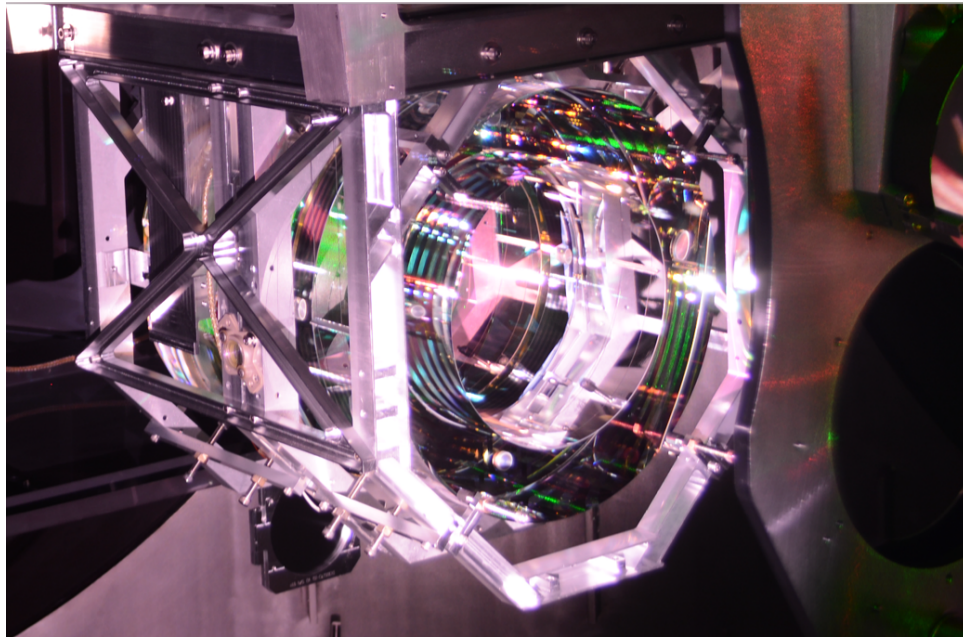
My best guess is that optical lever red light passes through the test mass and hits the back of the TMS, reflecting onto the inside of the front plate

beam on wall

Infrared light from regions around test mass reflecting off of first TMS mirror and missing other mirrors







**LHO ETMY at high sensitivity (bottom left)  
and during lock acquisition**

