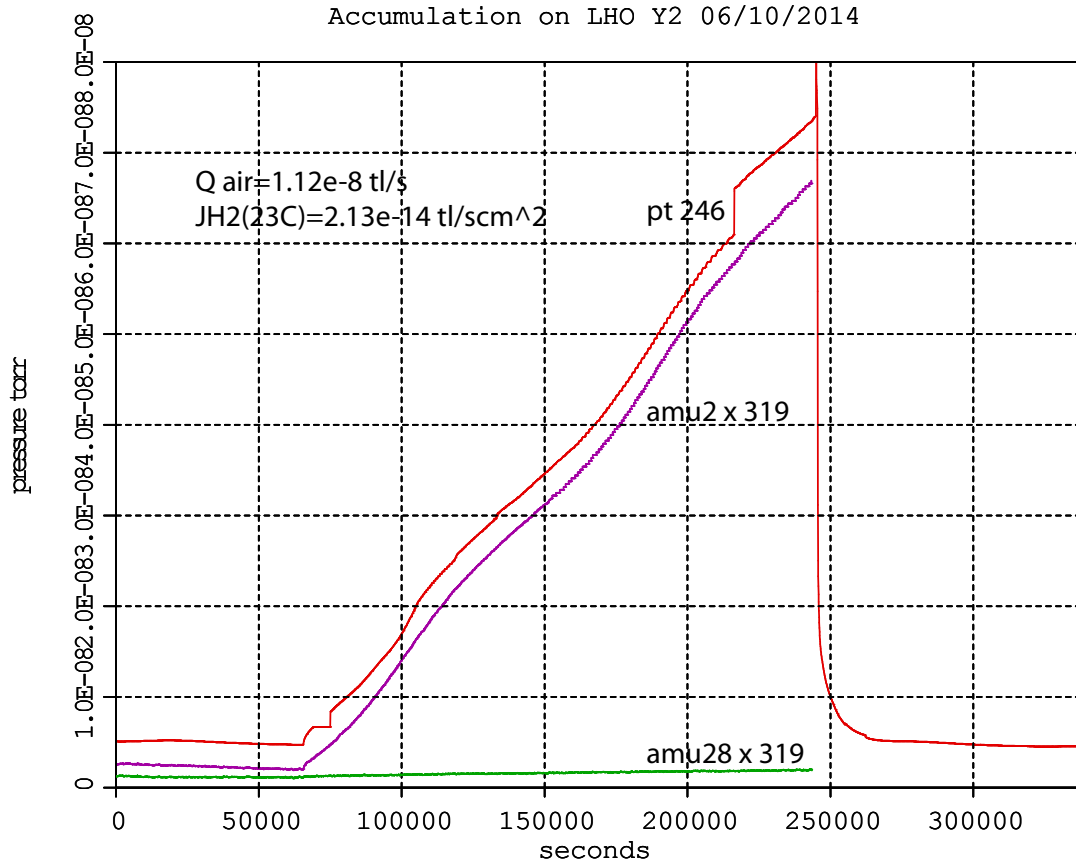


## Results from the Accumulation from LHO Y2 on June 10, 2014

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The figure shows the accumulation. The red curve is the pressure on the discharge gauge which is almost entirely due to hydrogen outgassing. The violet curve is the RGA ion current at amu2 multiplied by the gauge factor =  $3.187 \times 10^2$  torr/ampere determined from the discharge gauge. The green curve is amu28 ( $N_2$ ) multiplied by the same gauge factor. To convert the hydrogen pressure and amu2 reading to true pressure you multiply by 2 to account for the reduced ionization cross section. This factor is common to the discharge gauge and the RGA. The variation in the hydrogen curve around a straight line is due to the temperature changes in the tube which modulate the outgassing rate. The curves correspond to a hydrogen outgassing rate of  $J(H_2, 23C) = 2.13 \times 10^{-14}$  torr liters/sec  $cm^2$  and an equivalent air leak rate of  $Q = 1.12 \times 10^{-8}$  torr liters. The hydrogen outgassing rate is consistent the measurements made in 2000 and the equivalent leak rate is most likely an upper limit and is too small to measure with the techniques we have developed to find leaks in the beamtube. The leak is small enough not to disturb advanced LIGO sensitivity.

The equivalent leak measured in y2 April 10, 2014 was  $Q = 6.9 \times 10^{-8}$  torr liters/sec. The corrections made for the bellows coupling in that measurement may be responsible for the difference. The new measurements are directly coupled to the beamtube and more reliable.