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From: Rainer Weiss <weiss@tristan.mit.edu>
To: cit-all@tristan.mit.edu, mit-all@tristan.mit.edu
Subject: beam tube vacuum

To: cit-all mit-all
concerning: State of the beam tube vacuum at Hanford

The X2 beam tube module is currently at a pressure of 5×10^{-6} torr at the midpoint of the tube after 38 hours of pumping by the turbo carts. The pressure is now limited by outgassing by water from the tube walls and is varying slowly as $1/\text{pumping time}$. The pumping time is counted from the beginning of the evacuation, approximately 300 hours ago. The water outgassing is about twice as large as that experienced in the beam tube qualification test. By measuring the beam tube residual gas spectrum, after removal of condensable species with a liquid nitrogen trap, we have set an air leak upper limit of 10^{-5} torr liters/sec. The dominant peaks in the residual gas spectrum are hydrogen, carbon monoxide, carbon dioxide and some water which by-passes the liquid nitrogen trap. The next steps are to calibrate the measurement and pumping system and then determine the definitive limit for air leaks and prebake outgassing rates.

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