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MEMORANDUM

To: Rethinking Dark Matter attendees

From: Peter Fisher

Subject: Resolving DAMA/Libra

Date: Friday, April 21, 2016

For over a decade, the DAMA/Libra collaboration has asserted that they have observed a signal underground with an astrophysical correlation. Many other experiments exclude the region of mass-cross section in the simplest dark matter model parameter space favored by the DAMA/Libra result.

The dark matter community feels the DAMA/Libra collaboration has not been responsive in providing information about their experiment to allow an independent assessment of their results, causing some to dismiss their results entirely. At the same time, theoreticians have developed models and theories that reconcile DAMA/Libra with other experiments that exclude the region of parameter space favored by DAMA/Libra. This situation has persisted for nearly ten years. The DM-Ice experiment has deployed a 17 kg NaI(Tl) detector and operated for 3.6 years with no evidence of a signal. The DM-Ice17 exclusion limit is about a factor a hundred from the region favored by DAMA/Libra and DM-Ice plans to deploy a larger detector in the coming years. What constitutes success for this endeavor?

Whether DM-Ice observes an annual modulation signal or not, it will be essential to explain what DAMA/Libra has been observing for the past thirteen years. DM-Ice is an exceptional experiment – in addition to searching for nuclear recoils from caused by dark matter, the purpose of DM-Ice is to undergo the scrutiny DAMA/Libra has refused.

Without an explanation for the DAMA/Libra observation, the annual modulation technique will remain severely compromised.