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An Experimental Determination of Static Magnetic Fields Induced Noise in Living Systems MEGAN BRADY, CRAIG LARAMEE, Binghamton University — Living systems are constantly exposed to static magnetic fields (SMFs) from both natural and man-made sources. Exposures vary in dose and duration ranging from geomagnetic ($\sim 50\mu$T) to residential and industrial ($\sim$10s of mT) fields. Efforts to characterize responses to SMFs have yielded conflicting results, showing a dependence on experimental variables used. Here we argue that low to moderate SMF exposure is a sub-threshold perturbation operating below thermal noise, and assays that evaluate statistical characteristics of a single cell may identify responses not consistently found by population averaging approaches. Recent studies of gene expression show that it is a stochastic process capable of producing bursting dynamics. Moreover, theoretical and experimental methods have also been developed to allow quantitative estimates of the associated biophysical parameters. These developments provide a new way to assess responses of living systems to SMFs. In this work, we report on our efforts to use single molecule fluorescence *in situ* hybridization to assess responses of NIH-3T3 cells to SMF exposure at flux densities ranging from 1 to 440 mT for 48 hours. Results will contribute to determining mechanisms by which SMF exposure influences gene expression.

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