Q1: What is considered an inherent or intrinsic magnetic gradiometer?
A1: In response to the AMBIENT BAA, DARPA is seeking innovative solutions for intrinsic magnetic gradiometers in which the magnetic gradient is measured in the physics itself in order to eliminate the need for intractably high SNR signal recovery. Solutions which difference outputs from independent scalar magnetometers, either electronically or digitally, would be considered non-responsive.

Q2: Is it sufficient for only one component of the gradient to be detected at the level of the performance metrics, for instance $\Delta B_y/d$, if the other components are not resolved?
A2: The AMBIENT objective is the measurement of the total magnetic field gradient: $(|B_1| - |B_2|)/d$, where $|B_1|$ and $|B_2|$ are the scalar magnitudes of the magnetic fields at sites 1 and 2, and $d$ is the distance between site 1 and site 2. Please see Amendment No. 1 to the BAA, which is now posted to FBO.gov, for more information.

Q3: Given the anticipated array-based applications, is there a desired cross-talk specification?
A3: Multiple sensors placed as close as packaging allows should meet all performance metrics of Table 1 in the BAA. Please see Amendment No. 1 to the BAA, which is now posted to FBO.gov, for more information.

Q4: Is the AMBIENT gradiometer single-axis or 3-axis?
A4: AMBIENT is developing a single-axis gradiometer.

Q5: Can control module volume and power be shared among multiple sensors?
A5: Each deliverable single-axis sensor and controller will meet the required power and volume metrics specified in Table 1 of the BAA.

Q6: Your Phase 3 picture indicates an umbilical cord between sensor and electronics. Are there any length restrictions? Does the cord count in the size metrics?
A6: The umbilical should be of sufficient length to allow testing of the sensor without electronic interference. If there are no active components in the umbilical it may be disregarded for volume measurement. If there are active elements, the cord must be included in the volume metric.

Q7: Do the program metrics have to be met for a moving sensor? Do we have to account for a dynamic (orientation) bias field?
A7: The BAA specifies a rate of 500 samples per second for device operation. While it is not anticipated that testing will be performed on a moving platform the total field could change in amplitude or direction at the same rate.