B-dot Analysis Questions — Ripu Nirwan

1. ***What exactly is the output from Peiyun's code?***
   When we create B-dot movies using Peiyun's code, it shows the magnetic data in the lab frame. Are the B_X and B_Y arrays in the code's output components of the field along the $X - Y$ coordinates as displayed in the movies, i.e., the lab frame? If so, then taking a cut of the output arrays to get the current sheet width requires some care because then, $B_{\text{rec}} = \sqrt{B_X^2 + B_Y^2}$ and we'd have to plot B_{rec} as a function of $r = \sqrt{X^2 + Y^2}$ at a particular θ (cylindrical coordinates) to get the current sheet's dimensions. Here, $\theta = 0^\circ$ would be along $+X$ and the current sheet width would be measured from a fit to $B_{\text{rec}}(r, \theta = 135^\circ)$ for $B_G = B_z/B_{\text{rec}} = 25$. If the code's output arrays (B_X, B_Y) are actually defined relative to the coordinates of the plane making up the probe measurement domain, then making fits directly to B_X/B_{rec} to obtain the current sheet's thickness would be fine because those components would (roughly) align with the current sheet's length anyway. So, understanding exactly what the B-dot processing code's output arrays are matters quite a lot.
2. ***What is the actual reconnecting magnetic field strength?***
   Regardless of their reference coordinate system, Peiyun's code returns seemingly normalized B_X, B_Y values. Does he list a reference value in his code? If so, what is it? And has it ever changed between analyses (don't have to know that answer to this one specifically, but you see why it would matter)? It'd help to ensure that we keep track of this value, especially between datasets with different B_G values. Making a plot of this reference value as a function of B_G throughout the analysis would be fantastic because we'd have a direct measurement to allay any concerns readers might have.
3. ***Can we quantify the asymmetry in the data?***
   This one's food for though in the long-term and aspirational. Some of the data (particularly at $B_G = 10$, from my experience) seem asymmetric: higher magnetic fields on one side of the sheet vs. the other. How can we go about quantifying this value and measuring it for different B_G? Should we integrate the magnetic data on either side of the sheet and plot it as a function of B_G to get a simple sense of said variation? Or should we plot $B_{\text{rec}}^2/8\pi$ on either side of $r = 0$ to get a sense of which side of the sheet holds more energy available for reconnection?

Lots to do for now, and I'll leave it up to you to tackle as you see fit. Thanks!