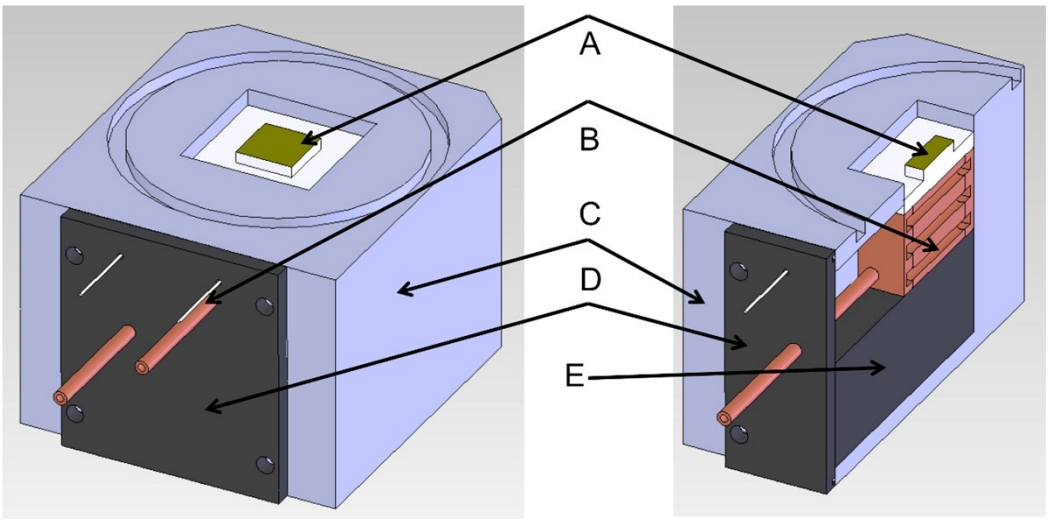

Figure 1. This is a schematic representation of the Peltier cooler based Cold Stage Block. Within the acetal housing **(A)** the spacing block **(C)** is in place to support the copper-cooling block **(D)** and the Peltier Cooling Device **(E)**. The copper-cooling block is a hollow block with an inlet and outlet tube which allow water to be pumped through the block. The inlet and outlet tubes of the copper cooling block as well as the leads for the Peltier Cooling device pass through the face plate **(B)**.

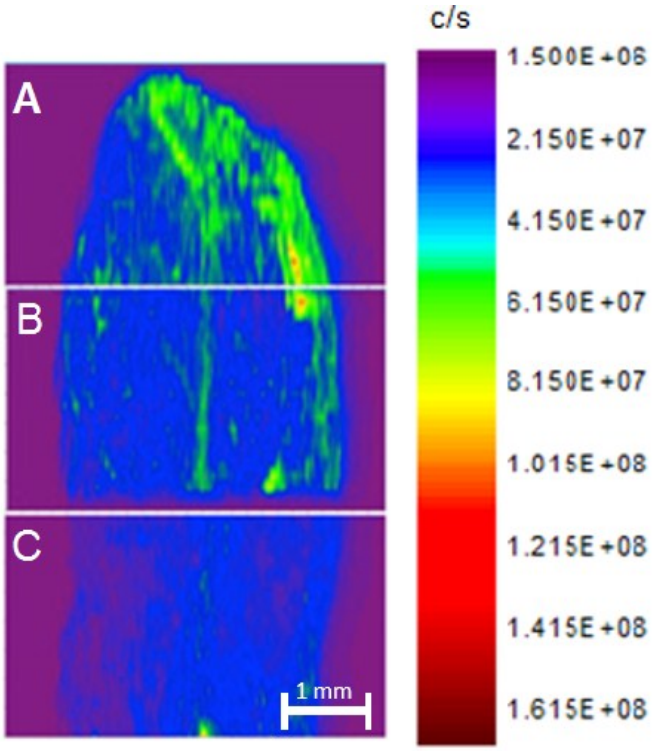

Figure 2: The measured intensities elemental mapping of ^{23}Na of an *A. thaliana* leaf taken from a plant grown under stressed conditions. **(A)** 40µm/s at 20Hz, **(B)** 40µm/s at 10Hz, **(C)** 40µm/s at 20Hz.

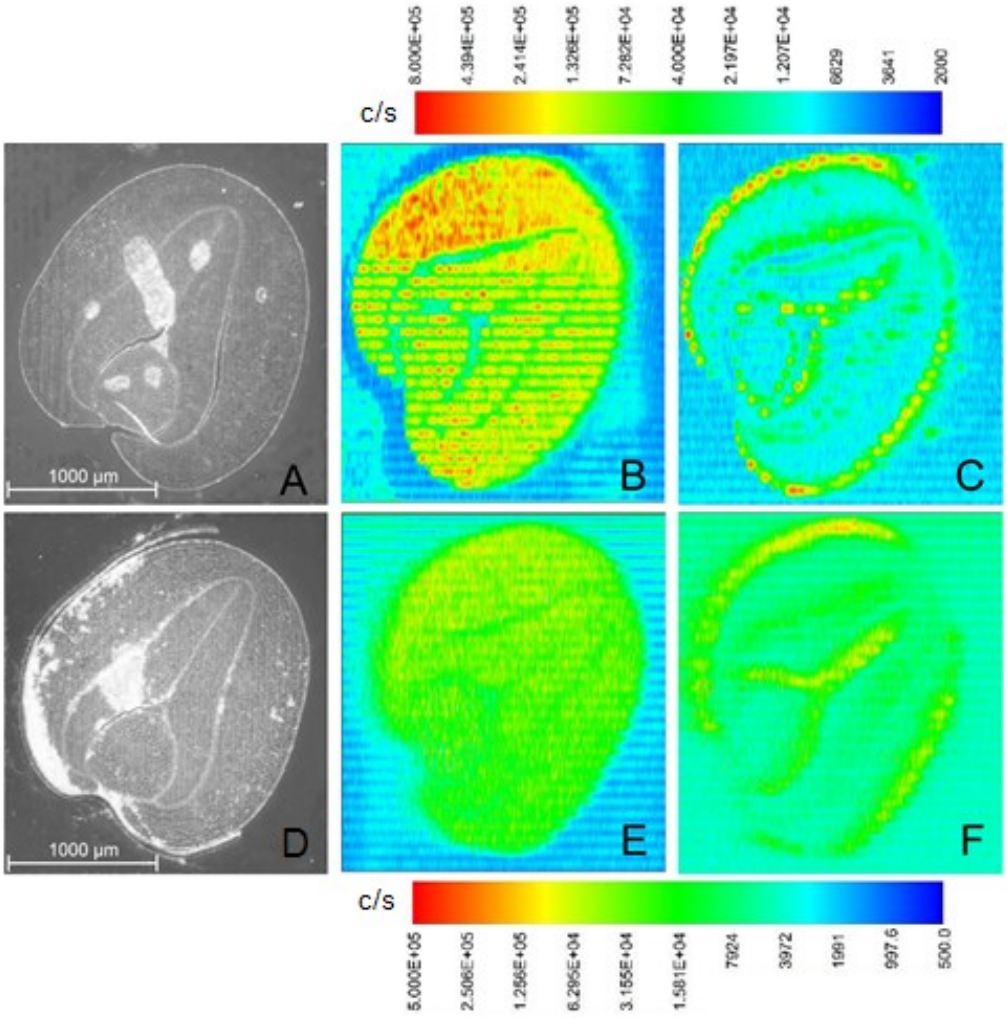

Figure 3: Top: **(A)** CCD pre-ablation image of *B. napus* seed section, cooled ablation of ^{31}P **(B)** and ^{55}Mn **(C)**. Bottom: **(D)** CCD pre-ablation image of *B. napus* seed section, normal ablation of ^{31}P **(E)** and ^{55}Mn **(F)** Differences in orientation between the CCD images and elemental images are due to shifts in placement when moving the seed to microscope after ablation. Artefacts in the images are due to the line scan method.

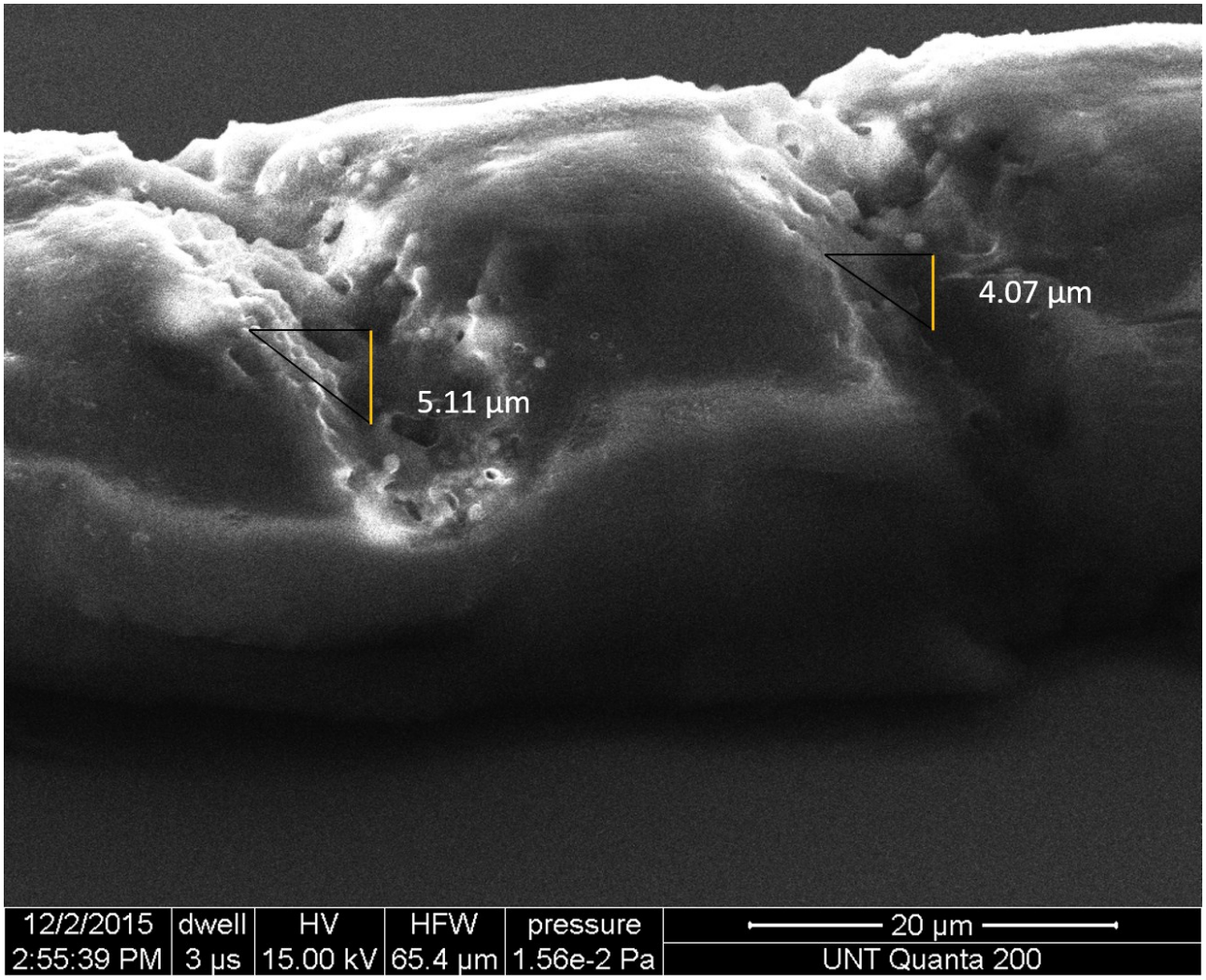

Figure S1. Scanning electron micrograph of two ablation passes on a C. elegans sample to determine the ablation depth after moving the laser focus down 30 µm on the z-axis. This change in laser focus results in an effective ablation depth of 1.04 µm with an overall ablation depth of 5.11 µm after 5 passes.

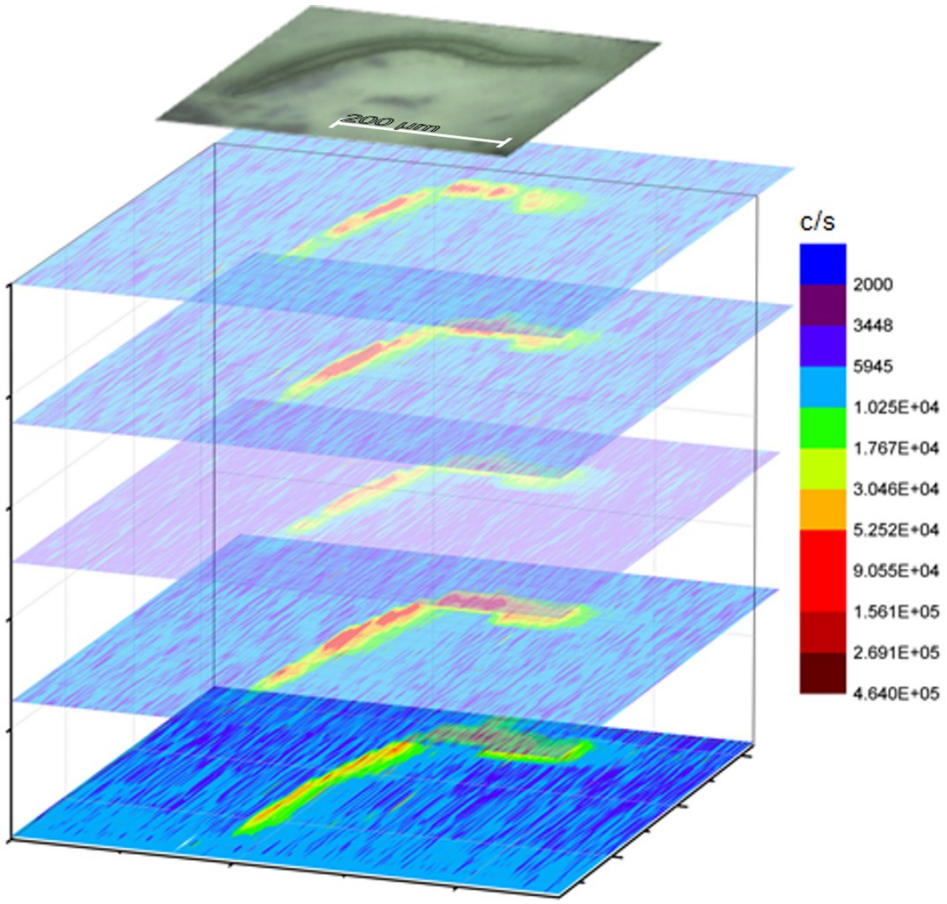

Figure 4: Stacked 2D measured intensities elemental maps of ^{31}P in a wildtype *C. elegans* worm at depth increments of 1.04 µm with an overlaid CCD image of the worm before ablation.