

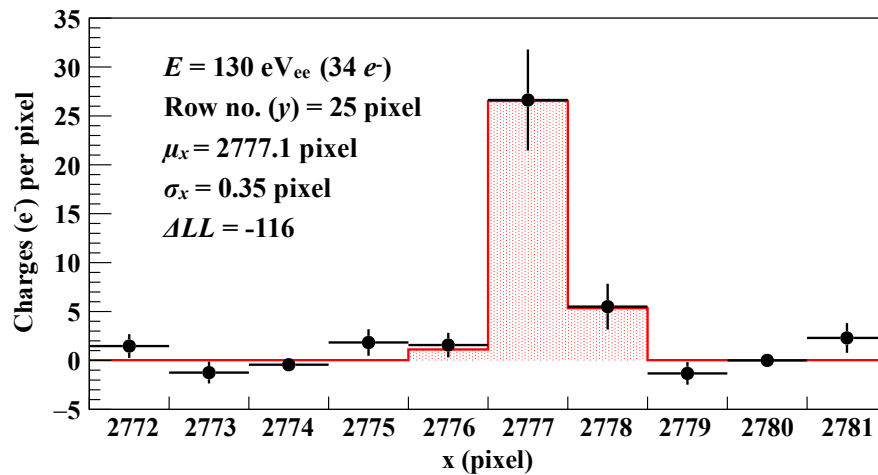
Read me: DAMIC data for EXCESS Workshop

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We describe the files included by the DAMIC Collaboration for the EXCESS workshop. The data correspond to the analysis published in Phys. Rev. Lett. **125**, 241803 (2020), which observed an excess of 17.1 ± 7.6 events over the background model. There is a strong statistical significance for the signal, with the “background-only” hypothesis disfavored with p -value 2.2×10^{-4} . The excess is well-described by a population of events with a uniform distribution in the bulk of the CCDs and an exponentially decaying spectrum with decay constant 67 ± 37 eV_{ee}.

1. excess-workshop-damic-data.csv

This file includes a list of final events (after removal of instrumental noise) with the energy and σ_x variables used in the two-dimensional WIMP-search fit. σ_x represents the “spread” of the cluster, which is positively correlated with the depth of the interaction in the CCD. To aid in the interpretation of σ_x , we include the probabilities—obtained from the best-fit background model—that the event is a surface background or a “bulk” component with a uniform spatial distribution. An example event from the publication is shown below.



2. excess-workshop-damic-background.csv

This file contains our best-fit background model projected on the energy axis. The full background model (not included) is in energy and σ_x . We provide the bin center of the histogram in keV_{ee} and the amplitude in events/keV_{ee}/kg/day (d.r.u.).

3. excess-workshop-damic-efficiency.csv

This file contains the detection efficiency for events distributed uniformly in the bulk of the CCDs. The efficiency is relative to the full CCD area. It does not reach 100% at high energies because a fraction of the image is “masked.” For unmasked regions, the CCD is fully efficient in detecting ionization events above 0.12 keV_{ee}. We also include the total WIMP-search exposure, which includes the masked CCD area, *i.e.*, multiply times efficiency to get “effective” exposure.

4. [excess-workshop-data.xlsx](#)

File with the three data sets above in separate sheets of a MS Excel Workbook.

We checked that by making an energy spectrum of the data events, subtracting the background model, and performing a fit with an exponential decay X detection efficiency, we recover a good approximation to the best-fit in the published analysis. See below.

