Supplementary Material

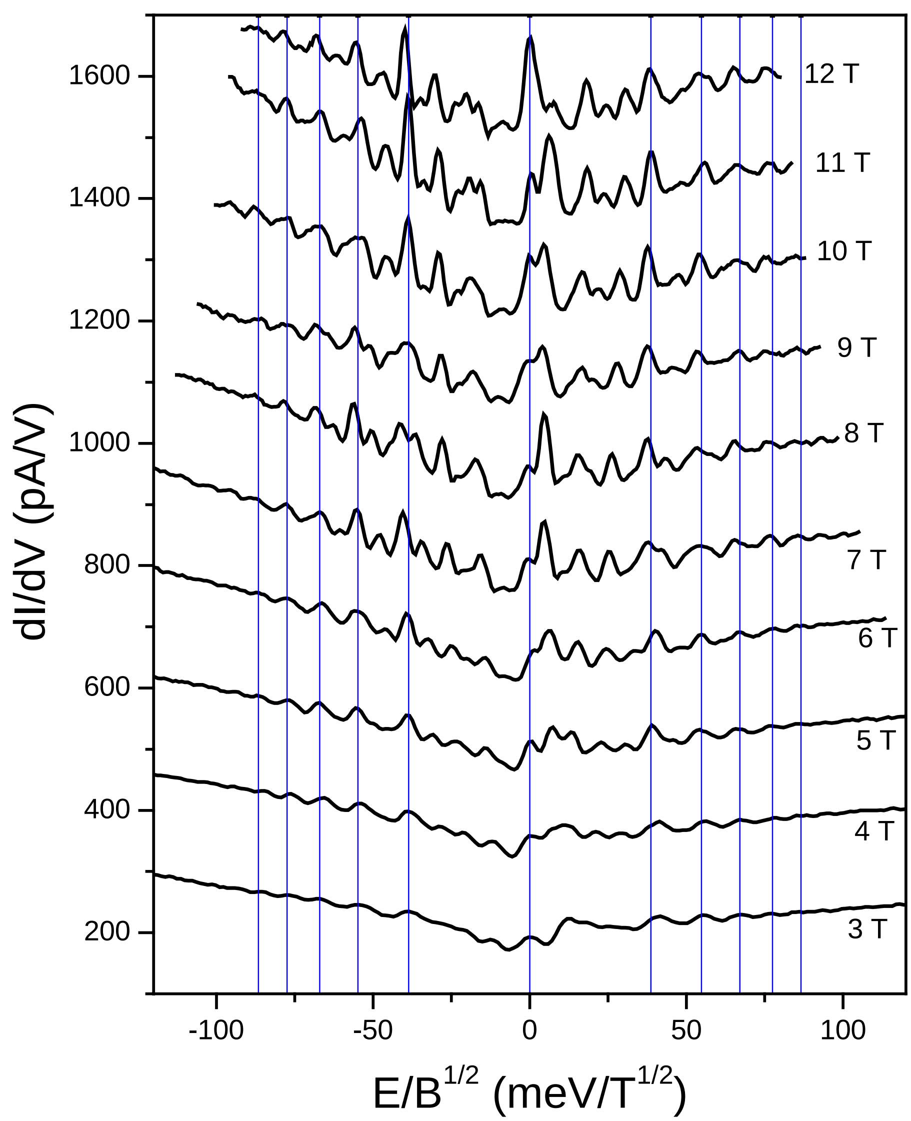

Figure S1 Landau levels of massless Dirac fermions. Solid lines are scaled tunneling spectra similar to the ones shown in Fig. 2 but continued up to 12 T. The spectra are shifted vertically as in Fig.1 for clarity. A richer structure and apparent crossing of peaks from different families, which are analyzed in Figs.2 and 3, becomes apparent in the high field data. The vertical lines corresponding to fits of the peaks to equation (2) are the same as the solid lines shown in Fig. 4a.

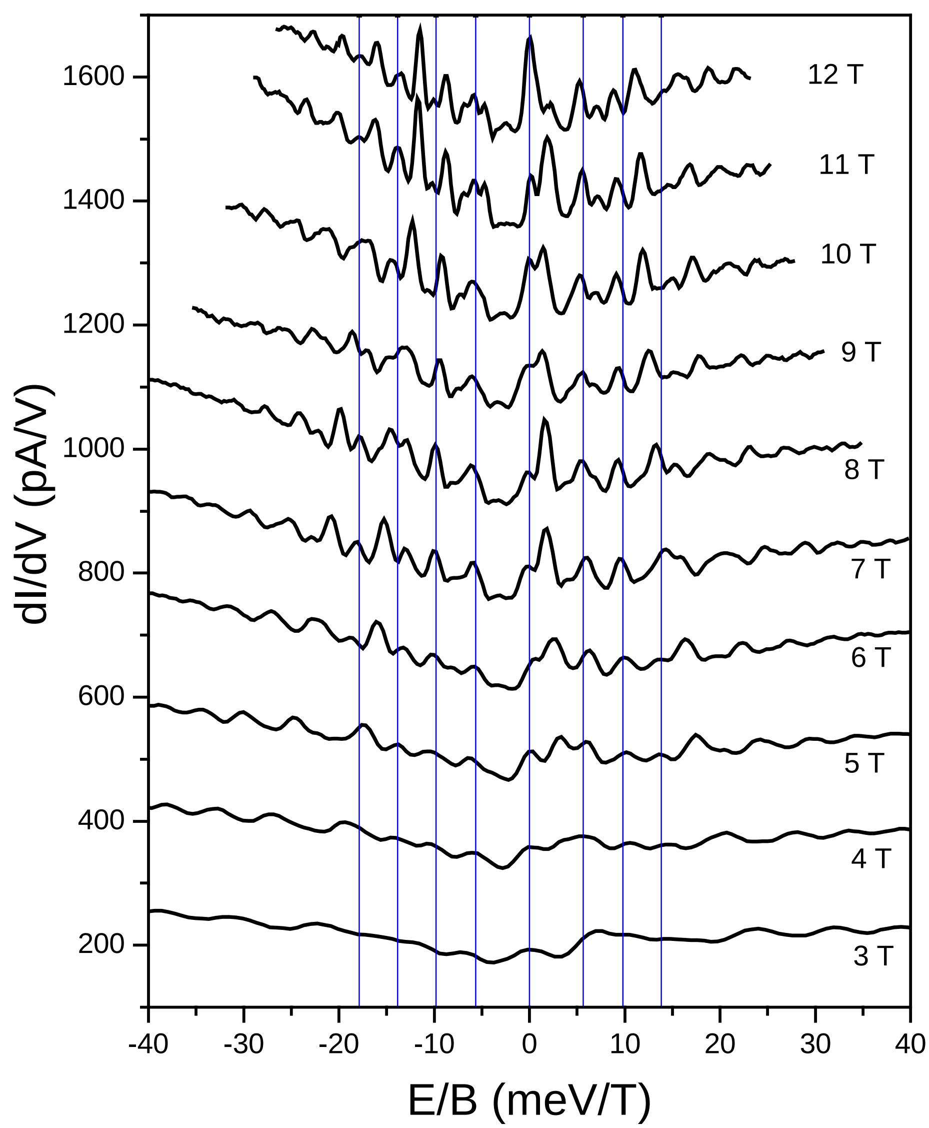

Figure S2 Landau levels of massive Dirac fermions. Solid lines are scaled tunneling spectra similar to the ones shown in Fig. 3 but continued up to 12 T. The spectra are shifted vertically as in Fig.1 for clarity. A richer structure and apparent crossing of peaks from different families, which are analyzed in Figs.2 and 3, becomes apparent in the high field data. The vertical lines corresponding to fits of the peaks to equation (3) are the same as the solid lines shown in Fig. 4b.

We carried out a series of experiments to investigate the effect of tip-sample distance on the tunnelling spectroscopy. In Figure S3, we plot the spectra obtained in a separate run for various tip-sample distances. The distance was varied by changing the tunnelling set-currents at a fixed bias voltage 150 mV. Larger set-currents correspond to smaller tip-sample distance. The asymmetry of the spectra observed here and occasionally in other runs remains to be understood. In what follows we focus on the well-resolved LLs. One can see that the peak positions are almost unchanged for set-currents below 100 pA, but they start shifting toward lower energies when the tip gets closer to the sample surface. This can be understood in terms of a Fermi energy shift due to band bending. We emphasize that the data discussed in the body of the paper were obtained with a large tip-sample distance (25pA) for which no measurable effect of the tip on the tunnelling spectra was observed. In order to study the effect of tip-sample distance beyond a trivial Fermi level shift, we moved the energy origin to coincide with peak A as explained in the text (see Figs. 1 to 3). As illustrated in Fgure S3**b** this procedure brings out a family of peaks that are well aligned on the energy axis. Using the procedure described in the text the aligned peaks are identify as massless DF. The data is then fit to obtain the Fermi velocity as a function of set-current shown in Fig. S3**c.** It is now easy to see that within experimental error the Fermi velocity remains constant for all tip-sample distances studied here. An analysis for the massive DF (the peaks that do not align) similar to that in the text gives the dependence of the effective mass on tip-sample distance. As shown in Fig. S3**d** the effective mass increases monotonically with set-current for currents exceeding 100 pA. When the current reaches 400 pA the mass enhancement exceeds 10%.

The ability to tune the effective mass at small STM tip-sample distances indicates that these electronic states are confined near the surface. Since the interlayer coupling controls the effective mass, a natural explanation of the tuning is that the tip induces a deformation of the sample surface leading to a change in the interlayer distance. However this effect is negligible at the large tip-sample distances at which the experiment reported in this manuscript were performed.

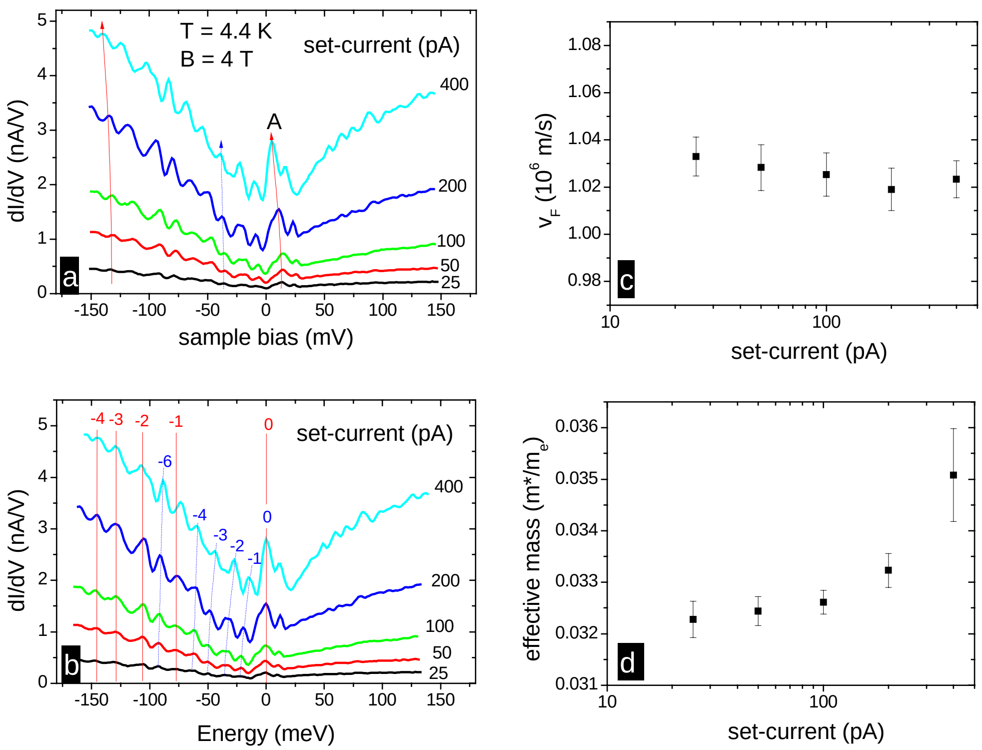

Figure S3 Effect of tip-sample distance on tunneling spectroscopy. **a**, Tunneling spectra as a function of tunnelling-current for fixed set-bias voltage 150 mV. Thin arrows show the shift of peak A as a function of tunnelling -current. **b**, Tunneling spectra after moving peak A (the Dirac point) to the origin in Figure S3a. Red thin lines and blue dotted line show two families of LL with their respective indices. **c**, The Fermi velocity, obtained by fitting the LL marked with red lines in Fig. S3b to equation (2), remains constant with increasing current. The n = -1 level for 400 pA is not included in the fitting because a nearby level of the other family at n = -5 significantly distorts its position. **d**, The effective mass, obtained by fitting the Landau levels marked with blue dotted lines in Fig. S3b to equation (3), is seen to increase with current.