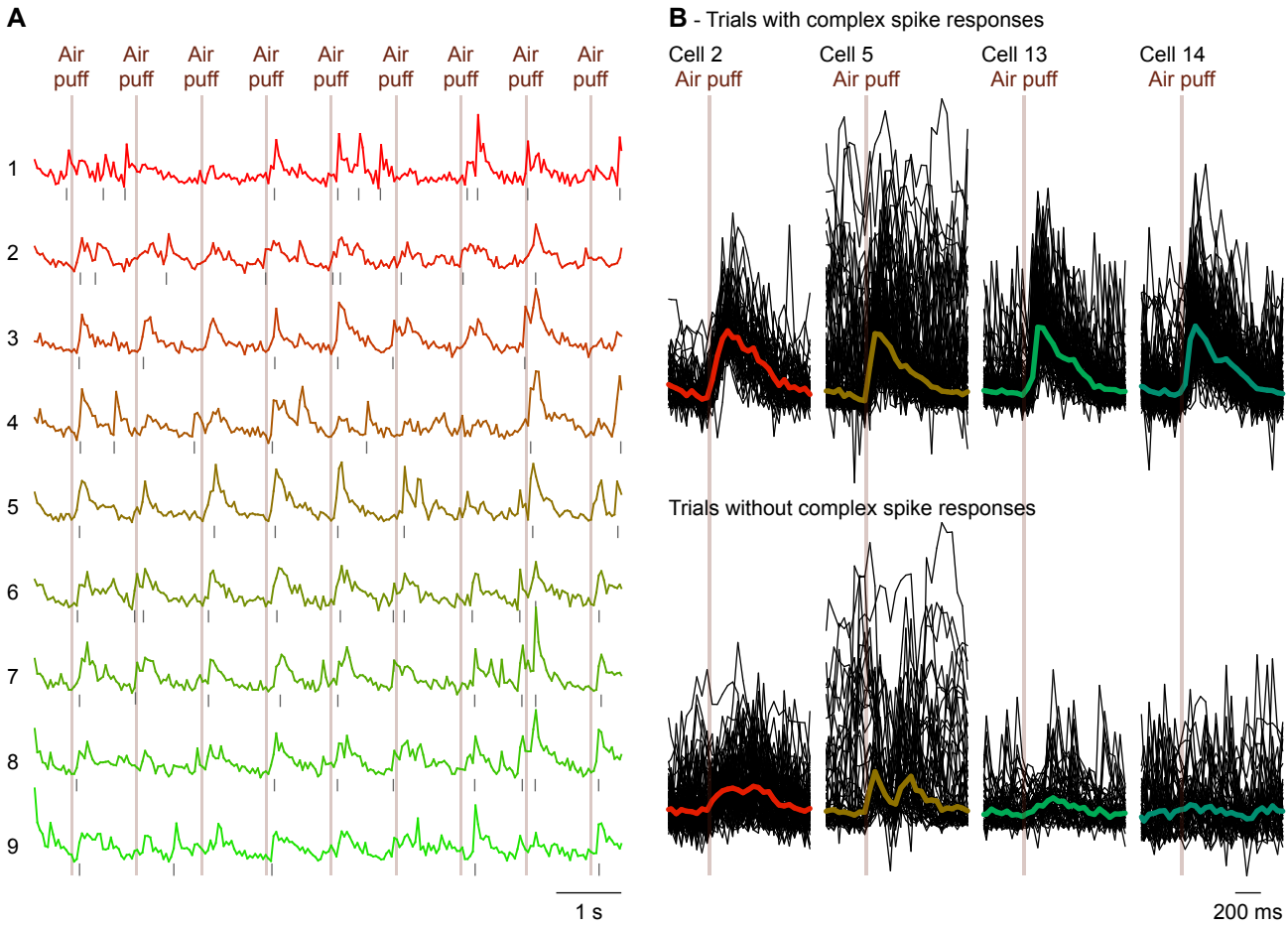

Figure S1 - Complex spike detection
(A) Enlarged view of the boxed area in Fig. 2B showing the time points of complex spike firing (indicated with grey lines below each trace). **(B)** Of the same experiment, we randomly selected four Purkinje cells of which all trials with (top) and without (bottom) a complex spike within 200 ms of stimulus onset are shown. The signals are scaled to the maximum of the median complex spike responses. The fat colored lines indicate the medians with the same color code as in Fig. 2. Trials without a complex spike response can still show an increased fluorescence, but the kinetics of the non-complex spike response differed from those of the complex spike responses. Note that the raw trace of cell 5 had a period with increased noise levels, making it the least reliable cell of this recording. Nevertheless, cell 5 had a complex spike response profile that was very similar to those of the other cells (see dashed line in Fig. 2F). Cells (in other recordings) that had a worse signal-to-noise ratio than cell 5 of this recording were excluded from analysis.

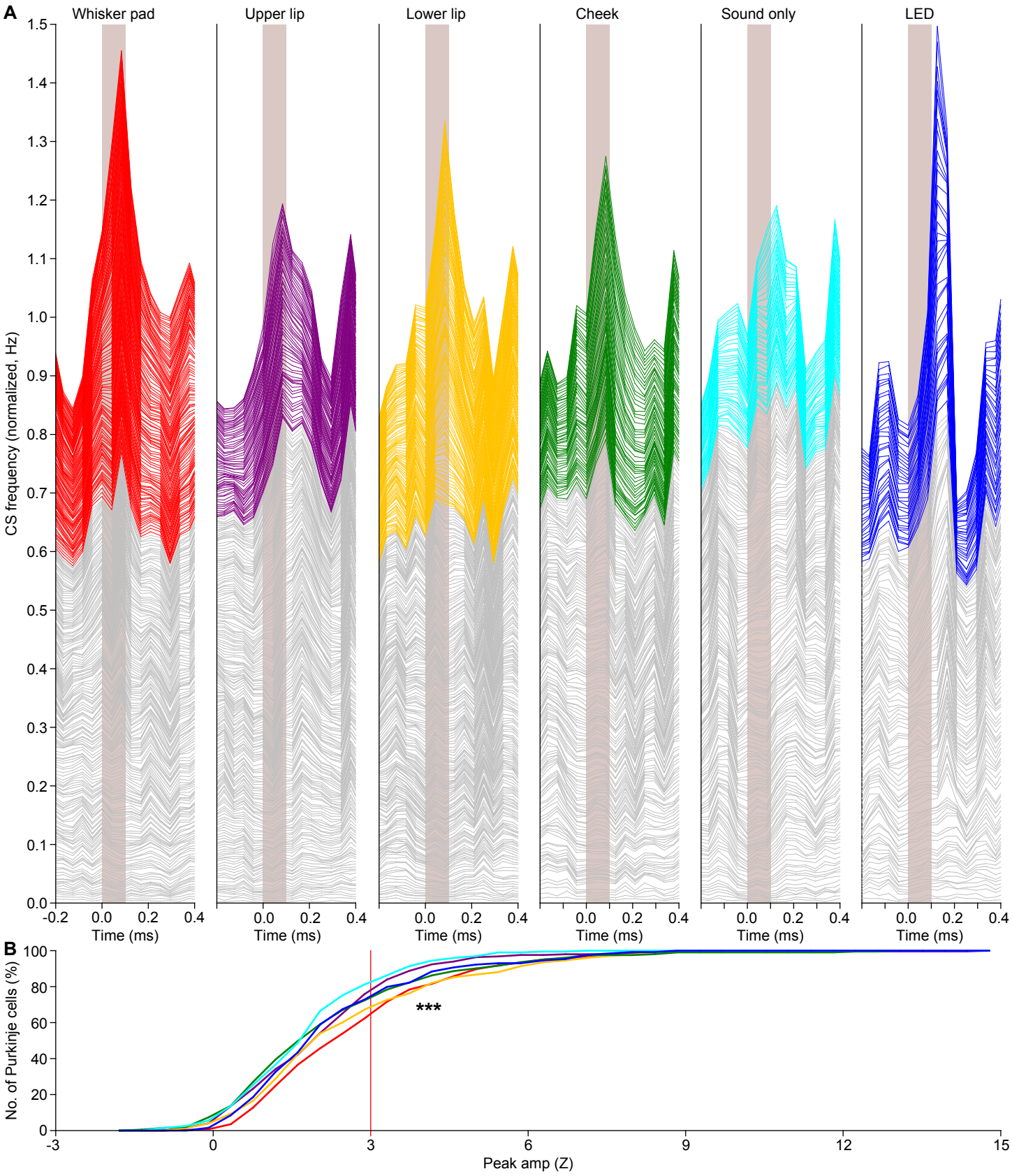

Figure S2 – Purkinje cells in crus 1 respond to various types of sensory stimulation

(A) Stacked line plots illustrating the peri-stimulus time histograms of all Purkinje cells recorded under either of the six indicated stimulus conditions (see also Fig. 3A). The cells are ordered based upon their peak responses (calculated as Z value) during the 200 ms interval following the stimulus onset, with the cell with the lowest response at the bottom of each graph. The grey lines indicate cells with a peak response deemed not significant (Z < 3), the colored lines indicate the significant responses (Z > 3). The graphs are normalized so that the upper line depicts the averge of all cells. As shown in Fig. 3B, one cannot discriminate between responsive and non-responsive cells in a black-and-white fashion. Instead, the cells form a continuum from not responsive at all to highly responsive. As this way of plotting relies on the numerical average, a skewed distribution can put emphasis on a relatively small group of cells. As the peak amplitude distributions indeed have a skewed distribution, they are also compared using cumulative histograms **(B)** using the same color scheme as in **A**. From this representation, it is confirmed that whisker pad and lower lip stimulation yield the strongest responses, while visual stimulation (LED) recruits a few cells with a relatively strong response, increasing the numerical average (see **A**). Here, we tested the complete distributions (*** $p < 0.001$; Kruskal-Wallis test). Pair-wise comparisons of all stimulus conditions are presented in Fig. 4.

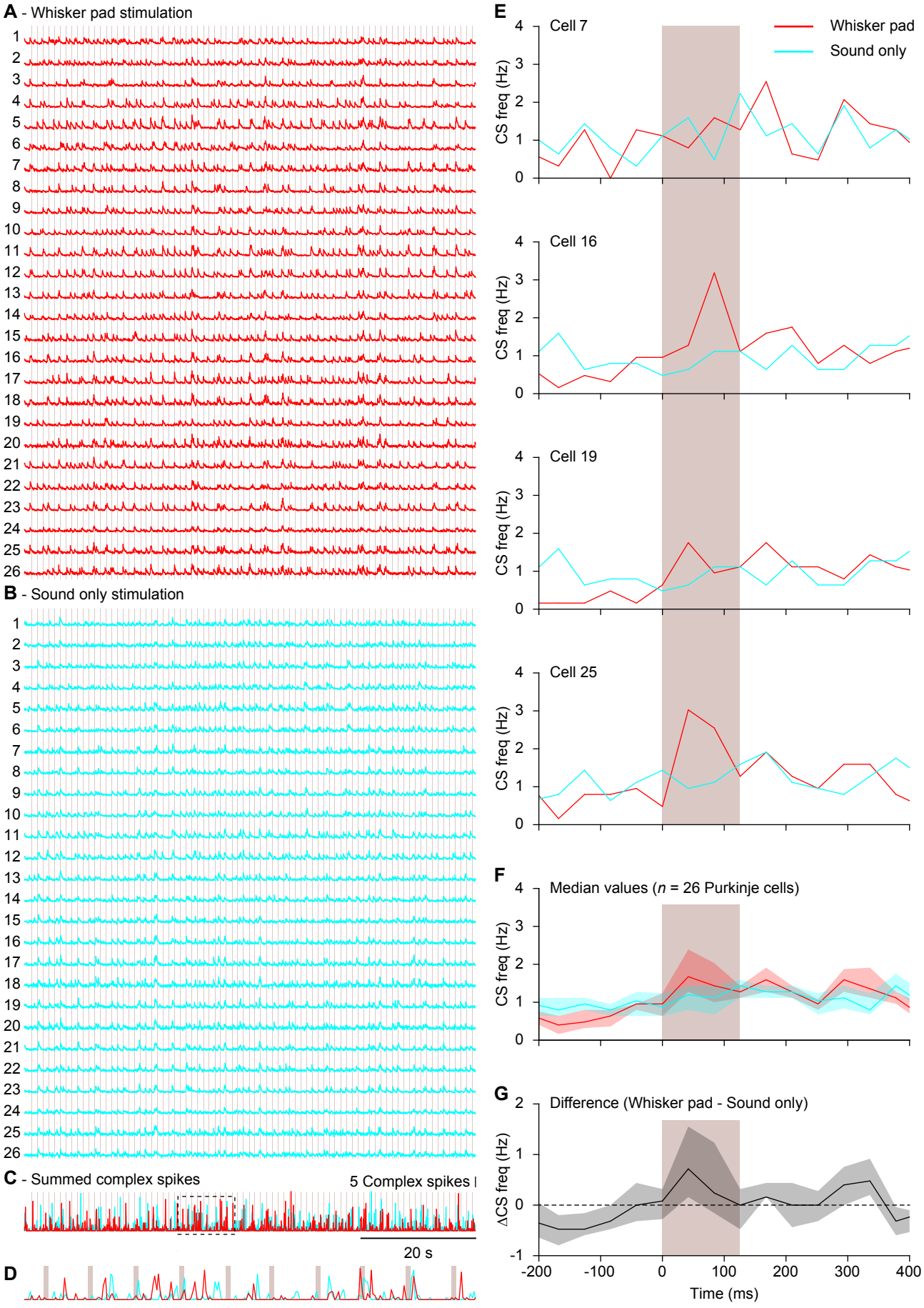

Figure S3 – Sound only stimulation systematically recruited less complex spikes than tactile stimulation
Fluorescent traces of 26 Purkinje cells in a field of view during whisker pad **(A)** and sound only **(B)** stimulation. The moments of stimulation (at 1 Hz) are indicated by the vertical lines. Note that the sound only stimulation involved the sound of the mechanical device delivering tactile stimuli. Overall, whisker pad stimulation triggered more complex spike responses than sound only as illustrated by the sum of the events **(C)**. The boxed part (10 s) is enlarged in **D**. **(E)** Peri-stimulus time histograms (PSTHs) of four randomly selected Purkinje cells from the experiment illustrated in A and B. In each, the response to whisker pad stimulation was stronger than to sound only stimulation, which is also reflected in the median of the PSTHs of all 26 Purkinje cells **(F)** and the median difference between whisker pad and sound only stimulation **(G)**. The shaded areas indicate the inter-quartile range.

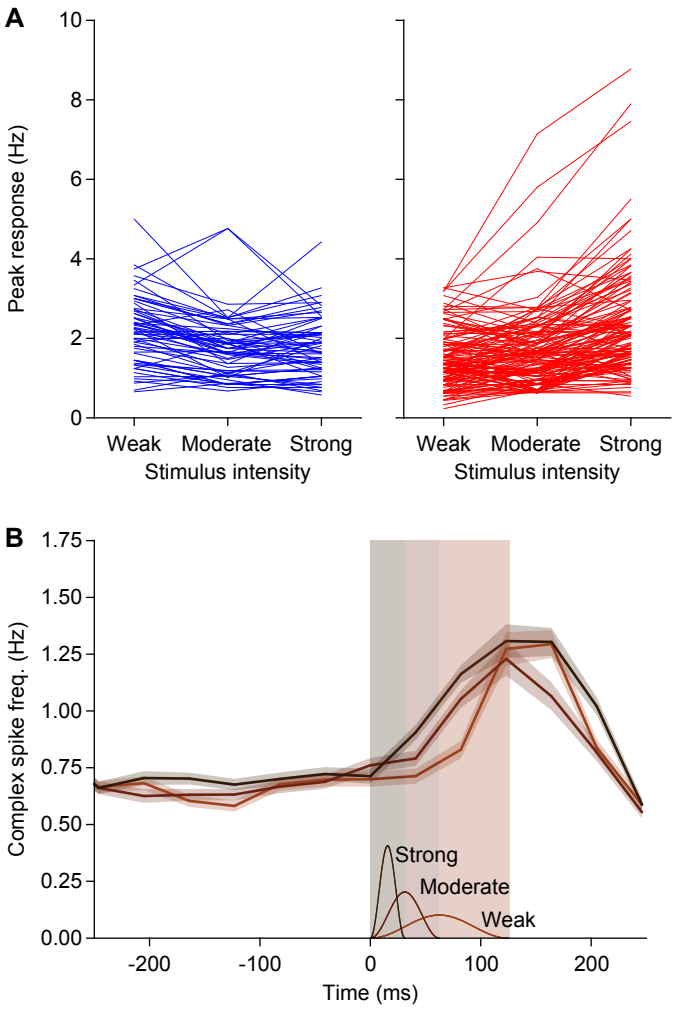

Figure S4 – Stimulus strength has only a minor impact on complex spike responsiveness
(A) Larger view of the data represented in Fig. 5E. Shown are the average complex spike rates during the frame with the strongest response per stimulus condition. The Purkinje cells that showed increased responsiveness to stronger stimuli are depicted in red and the others in blue. **(B) T**he average number of complex spikes per frame (of 40 ms) per trial (shaded areas: ± SEM) for the three stimulus strengths show little difference for the weak and moderate stimulation. The time course and amplitude (1-4 mm) of the three stimuli is schematized at the bottom of the graph. In contrast to Fig. 6, in this plot all 340 Purkinje cells are included, whether or not they displayed a significant response to the stimulus.