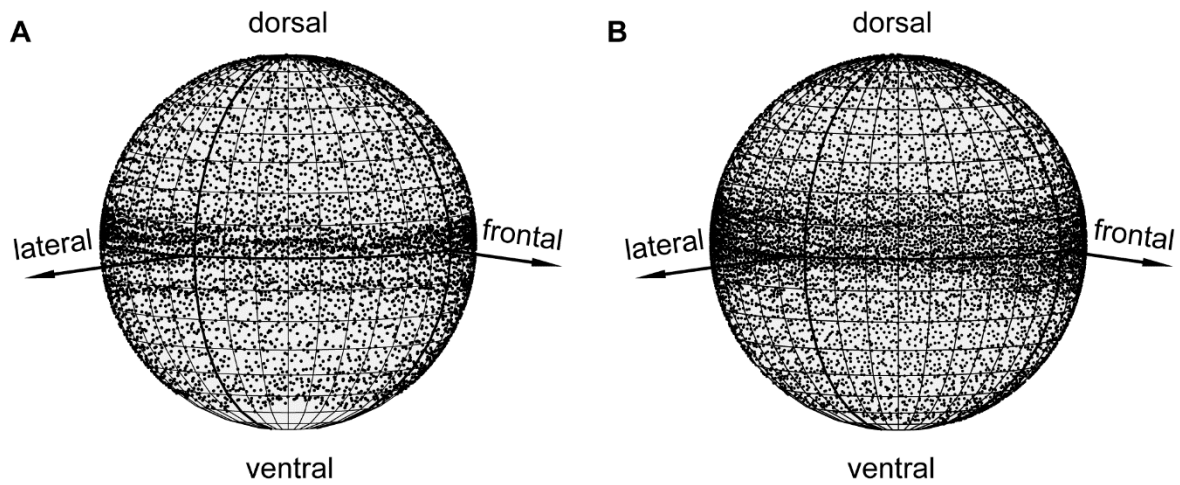
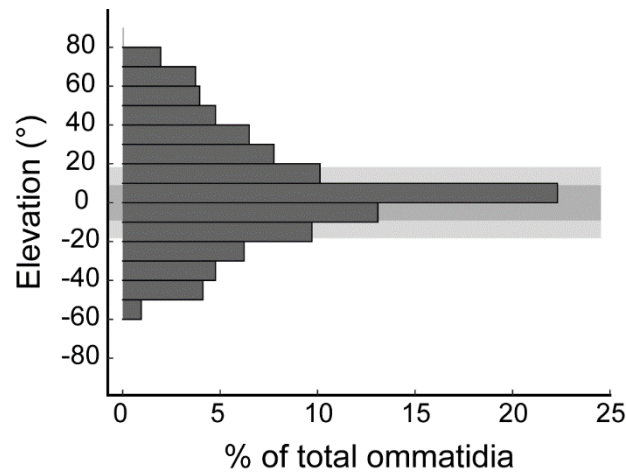


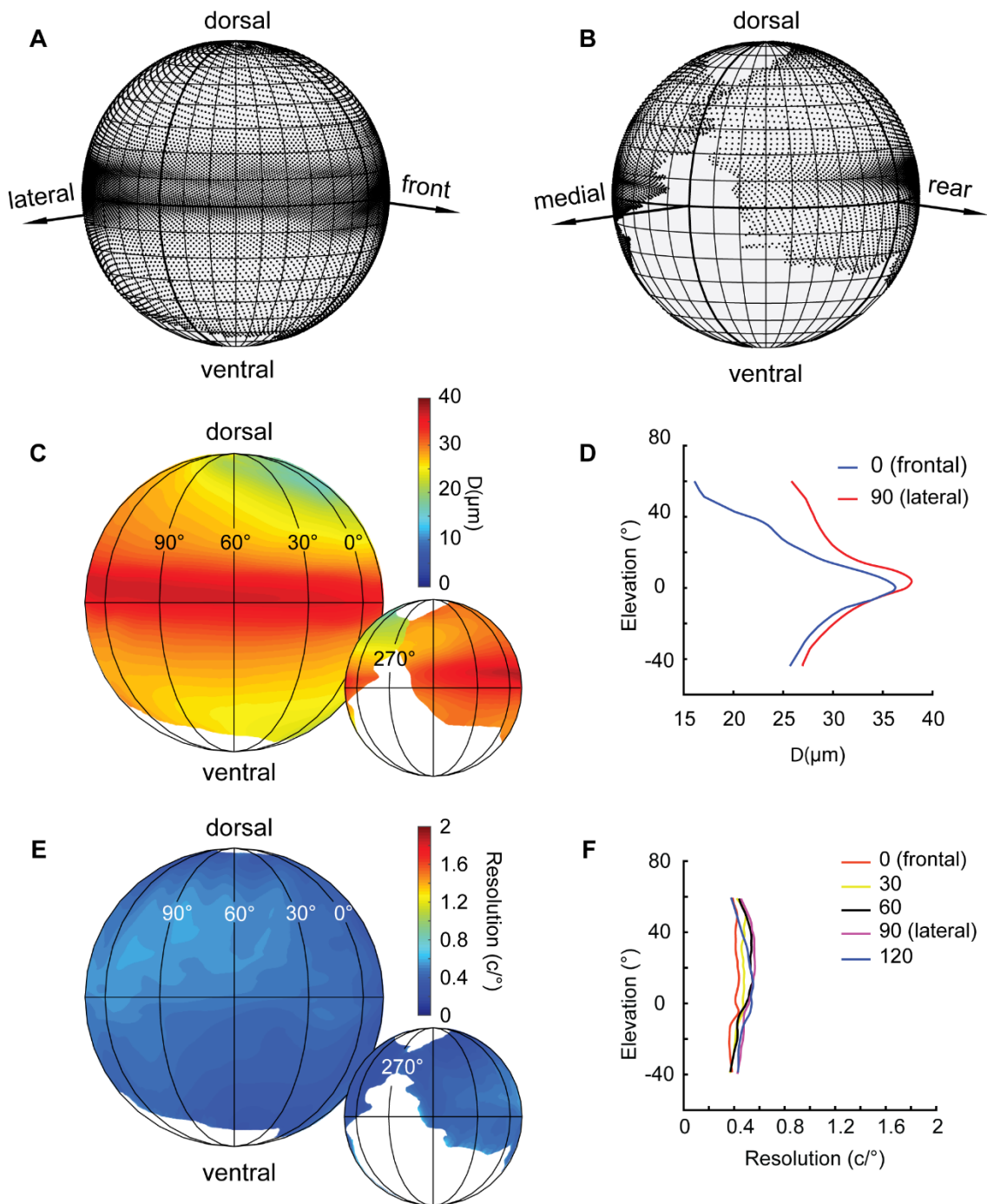
## Supplementary Material



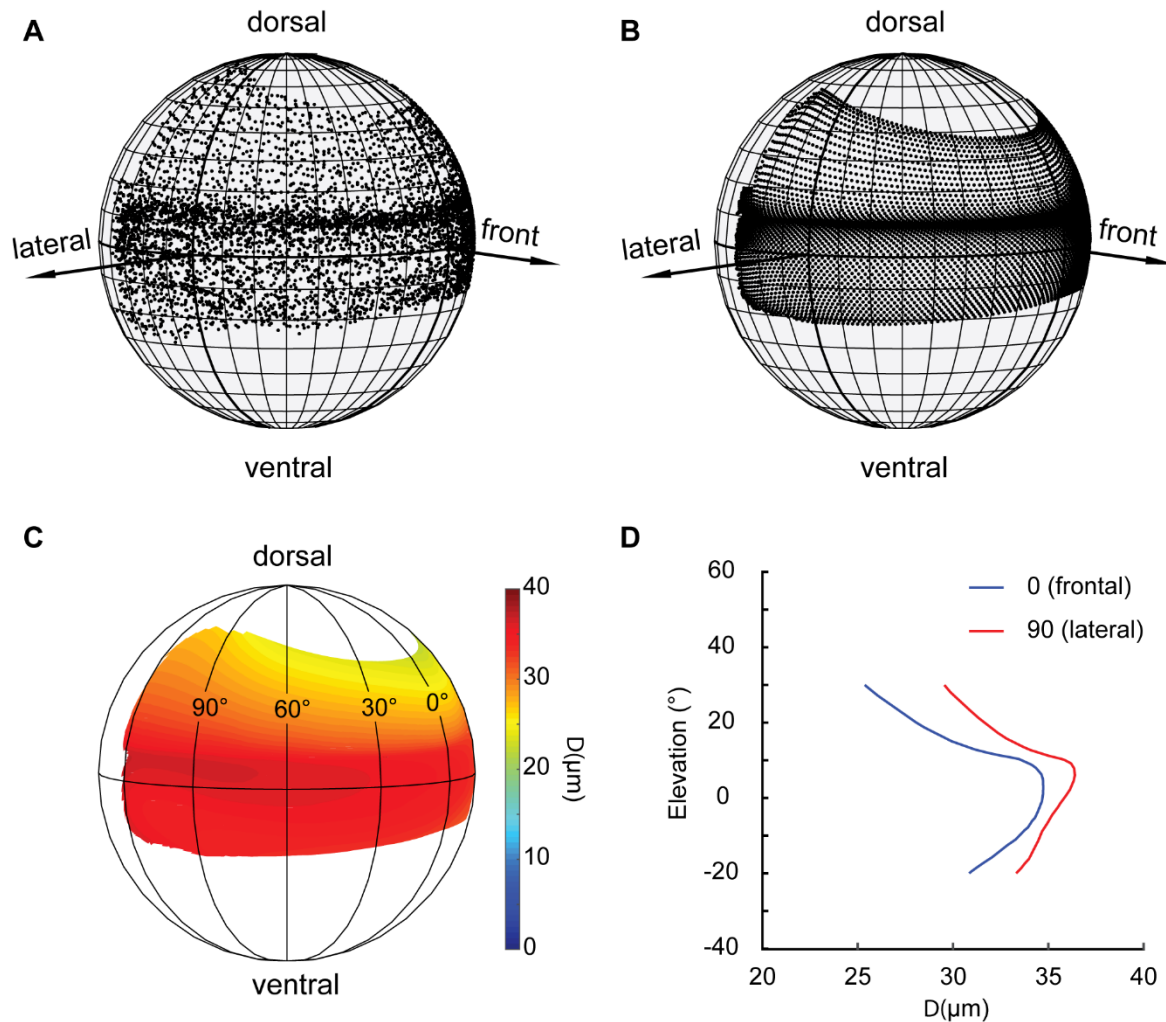
**Figure S1. The raw (unsmoothed) visual field.** The visual field of (A) the right eye of a male *G. dampieri* and (B) the right eye of a female *T. flammula*. Black dots represent the optical axis of each ommatidium mapped onto a surrounding sphere, the eye being assumed to be at the centre of the sphere and infinitely small. Two visual streaks are observable in both animals in the unsmoothed data as well as in smoothed representations (Figure 3 and Figure S3).



**Figure S2. Distribution of elevation viewing directions in *G. dampieri*.** 30% of the total of 9715 ommatidia are looking at  $\pm 9^\circ$  of elevation (dark grey band) and 50% are devoted to  $\pm 18^\circ$  of elevation (light grey band) illustrating the importance of the visual horizon for fiddler crabs.



**Figure S3. Analysis of the right eye of the female *T. flammula*.** (A, B) The visual field showing the projections of ommatidia onto a surrounding sphere. Black dots represent the mapped optical axis of each ommatidium into the surrounding sphere. Two streaks of high sampling are noticeable along the horizon, extending through most of the horizontal field of view. Please note that the reconstruction of the eye is not complete in the medial area of the eye, hence the larger gap in that eye region compared to *G. dampieri*. (C) The variation of facet diameter projected onto a surrounding sphere. (D) Two vertical transects of facet diameters in the front and lateral visual fields. The largest facets project predominantly around 5° above the horizon of the visual field. The female *T. flammula* has larger facets than the male *G. dampieri* (Fig. 7. Note the different scale on colour bar used in the figures for these two animals). (E) Spatial distribution of horizontal sampling resolution as a spherical map and (F) vertical transects of horizontal sampling resolution at several positions in azimuth. Horizontal resolution remains relatively constant across the visual field.



**Figure S4. Analysis of the right eye of the male *N. granulata*.** (A) The raw (unsmoothed) and (B) smoothed map of optical axis of (marked) ommatidia projected onto a surrounding sphere, the eye being assumed to be at the centre of the sphere. Only one visual streak is observable in both the unsmoothed and the smoothed representation. (C) The variation of facet diameter in spherical view, and (D) frontal and lateral vertical transects of facet diameter. The largest facets are found between 5° and 10° above the horizon in the lateral visual field and between 0° and 10° in the frontal visual field.