

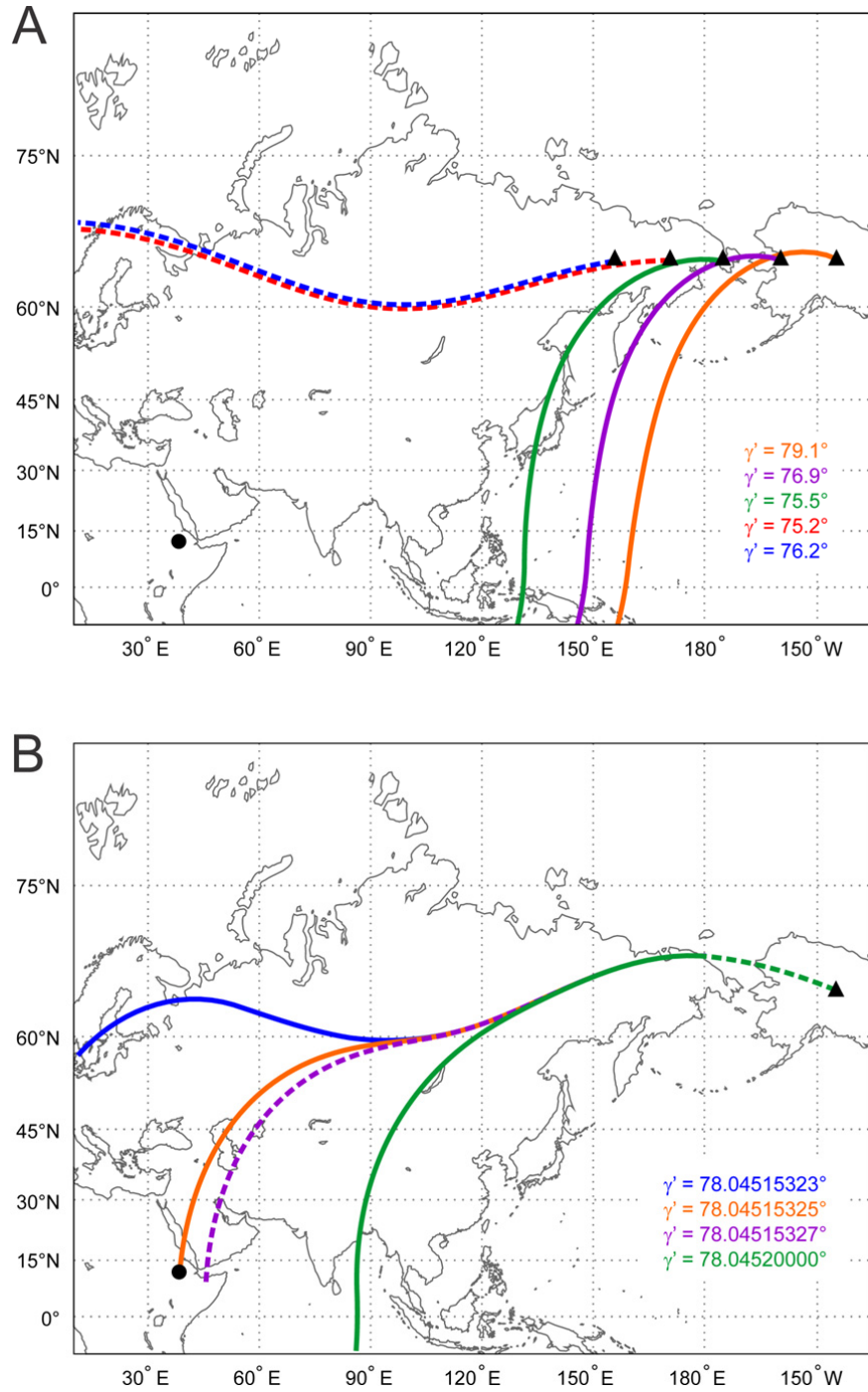


Figure S8. (A) Magnetoclinic compass routes of a northern wheatear (B070) departing from 66°N at different longitudes (155° E, 160° E, 175° W, 160° W, 155° W; black triangles) in westerly directions (270° relative to magnetic North). Because of the different angles of magnetic inclination at the different starting locations ($\gamma = 79.1^\circ, 76.9^\circ, 75.5^\circ, 75.2^\circ, 76.2^\circ$ from easterly to westerly sites), the bird starts with different apparent angles of inclination ($\gamma' = \gamma$). Depending on the distribution of magnetic inclination, the birds are either led immediately southwards (solid lines, where $\gamma' > \gamma$) or along the magnetic inclination isoclines (dashed lines, where $\gamma > \gamma'$). (B) Magnetoclinic compass routes of the same bird starting from its initial departure location with different γ' . It is possible for the bird to reach its destination (black dot at 13°N, 37°E) by using a magnetoclinic compass and without resetting the compass along the journey, but the path is highly sensitive to minute changes of the apparent angle of inclination (sensitivity $< 2 \times 10^{-8}$ deg.), making this strategy highly unlikely. The maps are in Mercator projection.