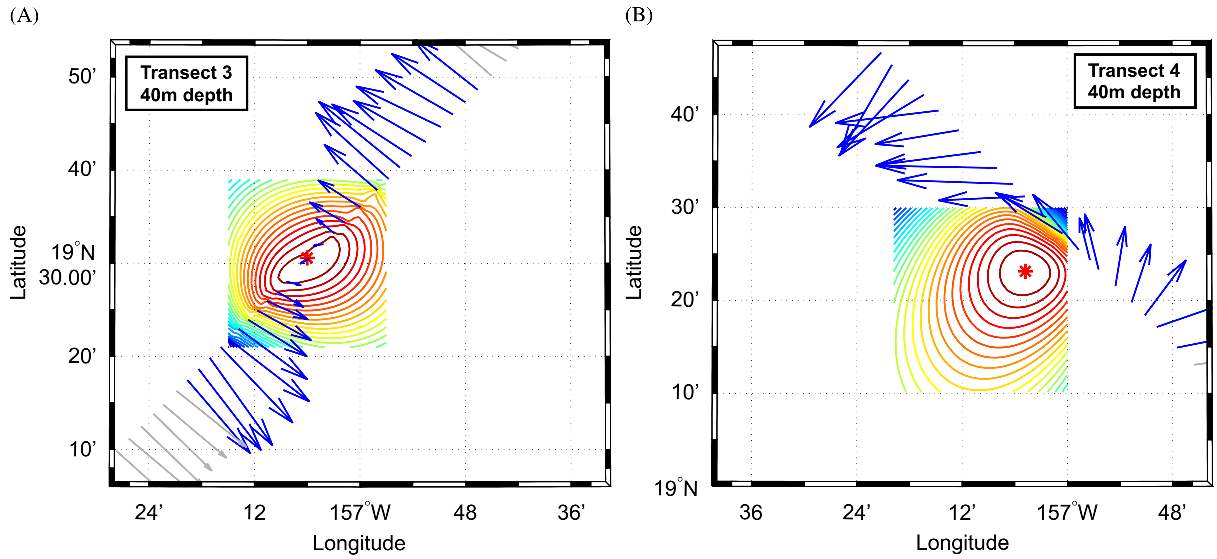

Fig. 10. Best estimated position of the center of Cyclone *Opal* at 40-m depth (red *) for Transect 3 (A) and Transect 4 (B). The areas encompassing the contour lines were divided into a 30 × 30 km grid. Tangential components of the blue vectors were computed for each point within the grids. For each transect, the center of the eddy was defined as the point for which the mean tangential velocity was maximal. Isopleths indicate values of equal mean tangential velocity.

center positions determined by maximizing the mean tangential velocity are always located within the same areas where the RMS values of the radial components are minimum, indicating that the analytical method we developed to locate *Opal*'s center is quite accurate.

Since the center of the eddy is the origin of the cylindrical coordinate system relative to which we have derived the radial and tangential components of velocity, the analysis of the radial distribution of these components can further confirm that the best estimates of the position of *Opal*'s center are relatively precise. In Fig. 11A and B the 40-m depth radial and tangential velocity components computed for Transect 3 are plotted against distance from the center of the eddy. Data from the transect were grouped into two radial sections, blue dots corresponding to data collected before crossing the center of the eddy (from Casts 13 to 20), while red crosses referring to data collected after the center was crossed (from Casts 20 to 25). Radial velocities are relatively small, less than 20 cm s^{-1}, throughout the whole transect. Values of tangential velocities are close to 0 cm s^{-1} up to a few km from the center, and, as already indicated for Fig. 9, they increase linearly with radial distance to reach their maximum value of about 60 cm s^{-1} at roughly 25 km from the center. After peaking they slowly decay as the radial distance further increases. The most striking feature evidenced by the plot is the great symmetry that characterized the two sections of this transect. At any given radial distance up to 25 km from the center, the magnitude of tangential velocities of both radial sections is roughly the same, indicating that the cyclonic circulation associated with *Opal* was fairly symmetrical. All these features (i.e. small radial velocities; near zero tangential velocities at small radial distances from *Opal*'s center; high symmetry in the cyclonic velocity field) indicate that the position of *Opal*'s center was estimated with very high accuracy for Transect 3. The small uniformly negative (inward) radial velocities found for Transect 3 seem to suggest a gradual relaxation of the pressure gradient associated with the eddy, as *Opal* was spinning down. However, this conclusion cannot be generalized for the whole duration of the experiment, as radial velocities from other transects, such as Transect 4 (see Fig. 12), 2, and 6 (not shown here), do not show similar characteristics.

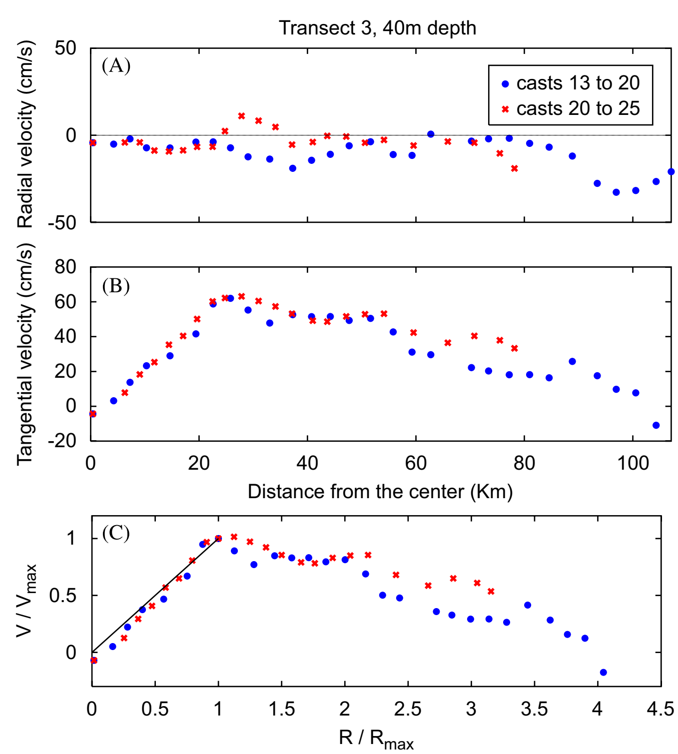

Fig. 11. Distribution of radial (A) and tangential velocity (B) with respect to radial distance from the center for Transect 3. (C) Distribution of normalized tangential velocity with respect to normalized radial distance. The solid line in this figure indicates values of equal angular velocity (V_{max}/R_{max}).

Important information concerning the dynamics of the eddy can be inferred by plotting tangential velocities as normalized by the maximum tangential velocity of each section (V_{max}) against radial distances normalized by the radius at which the maximum tangential velocity was found (R_{max}) (Olson, 1980). Normalized tangential velocities and radial distances for Transect 3 are plotted in Fig. 11C. The solid line in the figure represents values of constant angular velocity V_{max}/R_{max}. The figure shows that since