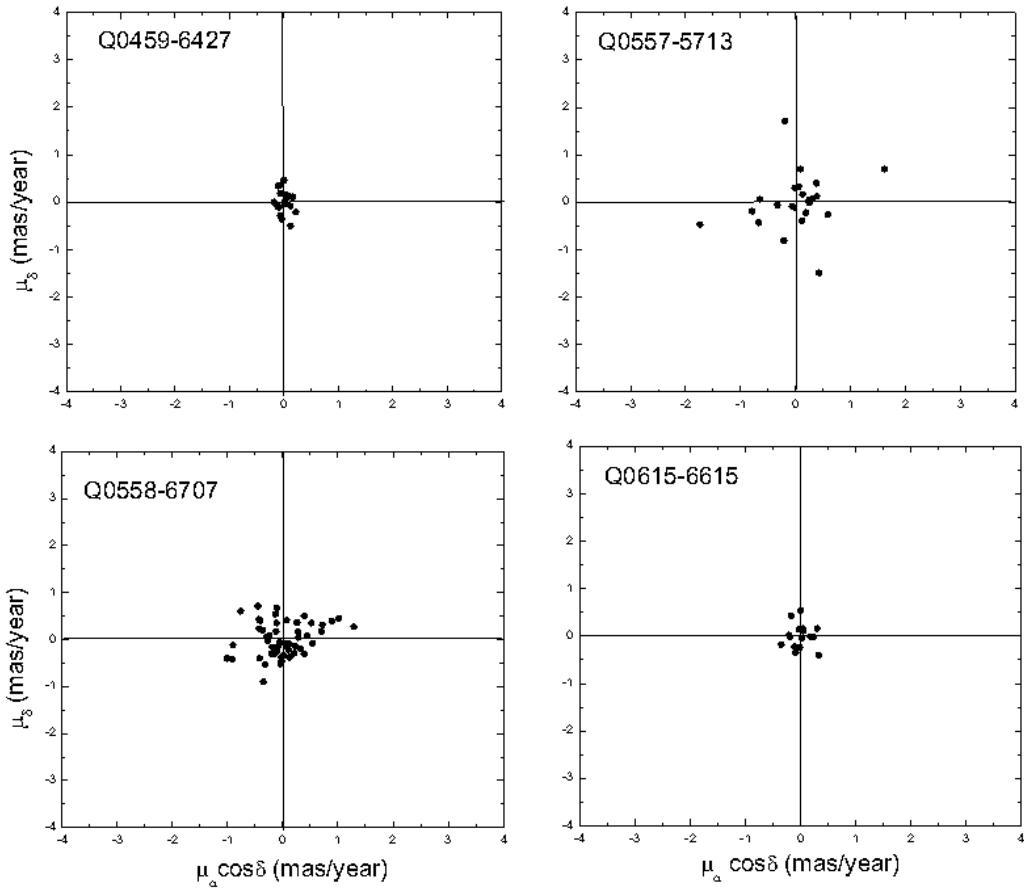

Fig. 1. Residual proper-motion maps for the reference stars. The dispersion around the mean is ±0.11, ±0.62, ±0.46, and ±0.19 mas yr^{-1} in R.A. ($\mu_\alpha \cos\delta$), and ±0.26, ±0.60, ±0.36, ±0.26 mas yr^{-1} in DEC (μ_δ), for Q0459-6427, Q0557-6713, Q0558-6707 and Q0615-6615, respectively.

$(\overline{x}, \overline{y})$ coordinates of the LRS stars in the image. Then, by averaging the barycentric coordinates of the best set of consecutive images taken for each QSO field throughout our program, a Standard Reference Frame (SRF) was defined for every field. Later on, all images of each field, taken at different epochs, were referred to its corresponding SRF (one per field). This registration process was done through a multiple regression analysis by fitting both sets of coordinates to a third degree polynomial of the form:

$$X = a_0 + a_1 x + a_2 y + a_3 x^2 + a_4 xy + a_5 y^2 + a_6 x^3 + a_7 x^2 y + a_8 x y^2 + a_9 y^3 \,,$$

$$Y = b_0 + b_1 x + b_2 y + b_3 x^2 + b_4 xy + b_5 y^2 + b_6 x^3 + b_7 x^2 y + b_8 x y^2 + b_9 y^3 \,,$$

where (X, Y) are the coordinates on the SRF system and (x, y) are the the observed barycentric coordinates. It was found that the above transformation equations yielded the best results for the registration into the SRF, showing no remaining systematic trends in the data. It must be noted here that in the previous studies of the fields mentioned above, quadratic and linear polynomials were adopted instead, for the registration into the SRF.

3. RESULTS

The results for the LRS stars are much improved (with the significant lower dispersion shown below), in comparison to those obtained by PCM06 and shown in their Tables 3–6. In Figure 1 we present the PM (μ) maps for the LRS stars obtained in this work. The dispersion around the mean in the figure turned out to be (in parentheses the values by PCM06) ±0.11 (±0.34), ±0.62 (±0.79), ±0.46 (±0.54), and ±0.19 (±0.41) mas yr^{-1}