TABLE 6

PROPER MOTION AND SPACE VELOCITY RESULTS FOR THE LMC
VDM02 PARAMETERS AND $V_{\rm rot} = 50$ km s^{-1}

Parameter	Q0459-6427	Q0557-6713	Q0558-6707	Q0615-6615
$\Delta\mu_\alpha \cos\delta$, rotation correction (mas yr^{-1})	−0.17	0.17	0.17	0.17
$\Delta\mu_\delta$, rotation correction (mas yr^{-1})	−0.06	−0.14	−0.14	−0.15
$\mu_\alpha^{\rm Field} \cos\delta$, LMC centered (mas yr^{-1})	1.5 ± 0.2	1.0 ± 0.2	1.1 ± 0.2	1.9 ± 0.2
$\mu_\delta^{\rm Field}$, LMC centered (mas yr^{-1})	0.2 ± 0.2	1.9 ± 0.1	1.1 ± 0.2	1.7 ± 0.2
$\mu_\alpha^{\rm CM} \cos\delta$, LMC centered (mas yr^{-1})	1.4 ± 0.2	1.2 ± 0.1	1.2 ± 0.2	2.1 ± 0.2
$\mu_\delta^{\rm CM}$, LMC centered (mas yr^{-1})	0.4 ± 0.2	1.7 ± 0.1	0.9 ± 0.2	1.3 ± 0.1
$\mu_\alpha^{\rm GRF} \cos\delta$ (mas yr^{-1})	0.9 ± 0.1	0.7 ± 0.1	0.7 ± 0.1	1.6 ± 0.1
$\mu_\delta^{\rm GRF}$ (mas yr^{-1})	0.3 ± 0.2	1.6 ± 0.1	0.8 ± 0.2	1.1 ± 0.2
$\mu_l^{\rm GRF} \cos b$ (mas yr^{-1})	−0.4 ± 0.2	−1.7 ± 0.1	− 0.9 ± 0.2	−1.4 ± 0.2
$\mu_b^{\rm GRF}$ (mas yr^{-1})	0.9 ± 0.1	0.5 ± 0.1	0.6 ± 0.1	1.4 ± 0.1
Π, velocity component (km s^{-1})	189 ± 28	199 ± 20	178 ± 25	306 ± 26
Θ, velocity component (km s^{-1})	65 ± 50	369 ± 28	182 ± 45	278 ± 36
Z, velocity component (km s^{-1})	133 ± 29	54 ± 21	80 ± 25	247 ± 27
$V_{\rm gc,r}$, radial velocity (km s^{-1})	86 ± 25	138 ± 18	106 ± 22	123 ± 24
$V_{\rm gc,t}$, transverse velocity (km s^{-1})	224 ± 32	399 ± 28	246 ± 38	466 ± 31

them having been corrected). In our set of data, a clear example of this kind of effect is the differential color refraction (DCR) whereas in Piatek et al. (2008) data it is the CCD charge transfer inefficiency. However, as mentioned before, both of these effects were corrected in the corresponding studies. In any case, to the best of our knowledge, the PM values in the present work are not greately affected by DCR, since the working set of images were all selected from those with hour angles less than 1 hr (in absolute value). The ground-based equipment (and its setup) used in our case, was a very stable one, with an optics with a minimal field distortion and whose parameters, as far as we know, were kept unchanged in all of our observing runs. The previously mentioned factors were quite appropriate for this type of astrometric studies.

5. SPATIAL VELOCITY OF THE LMC AND MASS OF THE GALAXY

Using the PM of the LMC determined in § 3, and the radial velocity of the center of the LMC (adopted from the literature), V_r, we can calculate the radial and tangential components of the LMC velocity, as seen from the center of the Galaxy. To do this we have followed the procedure outlined by JKL94. As mentioned before, in the calculations we used two sets of basic LMC parameters, namely, that adopted by vDM02, and that given by JKL94 (see previous section), along with radial velocities $V_r = 262.1$ km s^{-1} and $V_r = 250$ km s^{-1}, respectively. The rotational velocities of the LMC plane adopted for the range of distances from our studied fields to the LMC center (see § 4.1 in CMP09) were both $V_{\rm rot} = 50$ km s^{-1} and $V_{\rm rot} = 120$ km s^{-1}. The two sets of parameters were used to allow an easier comparison of our results with those of the rest of the authors in Table 5 and for following discussions.

In order to calculate the tangential and radial components of the LMC spatial velocity as seen from the Galactic center and with respect to the Galactic Rest Frame (GRF), from the previously measured PM, we have followed a series of steps, which were carried out through an ad-hoc computer software written by the author (MHP). These include: a correction of the PM values for the rotation of the LMC plane; a transformation of the corrected PM into R.A. and DEC velocities centered on the field; a transformation of these two velocity components, into heliocentric (hc) galactic longitudinal and latitudinal velocity components for the center of the LMC; a transformation of the previous velocity components into their galactocentric (gc) counterparts which, in turn, were combined to derive the transverse velocity, ($V_{\rm gc,t}$) of the LMC center with respect to the Galactic center. Similarly, in order to obtain the galactocentric radial velocity ($V_{\rm gc,r}$) for the LMC center, we