

THE STUDY OF PROPER MOTIONS IN THE
FIELD OF THE GALACTIC CLUSTER
NGC 7243

Evgueni Jilinski^{1,2}, Marcelo Assafin³,
Vladimir Frolov², and Julia Anan'evskaia²

The open cluster NGC 7243 ($l = 98.9^\circ$, $b = -5.6^\circ$) was investigated and described by numerous authors. Various data on this cluster were given by J. Holteck, R. Melotte, S. Raab, M. Hrabák, R. Trumpler, H. Shepley, P. Collinder, R. Zug, G. Lengauer, J. Becker, & J. Stock, P. Mianes & J. Daguillon, H. Schewick, G. Hill, & J. Barnes, M. Muminov, & E. Rakhmanov. The observational material of the present investigation of proper motions in the region of galactic cluster NGC 7243 was obtained with the Normal Astrograph ($D = 330$ mm, $F = 3500$ mm, scale $-59.57''/\text{mm}$) of Pulkovo Observatory. The total number of astroplates is 21, the first one was obtained in 1897 and the last in 1996. More recently the astroplates of the same region were obtained, with the 1-m Schmidt telescope of the Radioastrophysical Observatory, Latvia, for BV photographic photometry of all the stars under investigation. All these plates were measured with the Sartorius iris-photometer of Pulkovo Observatory and the catalogue of BV magnitudes of 2607 stars in the region of NGC 7243 was prepared. According to the agreement between the Observatório Nacional and the Pulkovo Observatory, the measurements of the astroplates were made with the PDS microdensitometer of ON. Measured field on every plate corresponds to the region $80' \times 80'$ on the celestial sphere, centered on the cluster. We present the preliminary results based on measurements of 6 plates. Every plate was measured in both the direct and reverse orientations. The analysis of the obtained proper motions permitted to evaluate the accuracy and to examine the stellar magnitude effects. As the first result, we obtained catalogue of positions, proper motions, B and V magnitudes for 2493 stars. The mean error of the obtained proper motions is about 1 micron (0.06 arcsec) for the epoch difference of 85 years.

¹Observatório Nacional, Rio de Janeiro, Brazil

²Pulkovo Observatory, St. Petersburg, Russia

³Observatório do Valongo, Rio de Janeiro, Brazil

A FULL-SKY SURVEY SEARCH FOR
EXTRATERRESTRIAL INTELLIGENT
SIGNALS: AN ANALYSIS OF THE RESULTS OF
PROJECT META

G.A. Lemarchand^{1,2}, F.R. Colomb^{1,3},
E.E. Hurrell¹, and J.C. Olalde¹

Project META (Mega Channel ExtraTerrestrial Assay), a full-sky survey for artificial narrow-band signals, has been conducted by Horowitz & Sagan (1993, ApJ, 415, 218) from the Harvard/Smithsonian 26-m radiotelescope at Agassiz Station and from one of the of two 30-m radiotelescope of the Instituto Argentino de Radioastronomía (IAR; Colomb et al. 1995, ASP Conf. Ser., 74, 345). The search was performed near the 1420 MHz line and its second harmonic, using two 8.4×10^6 channel Fourier spectrometers of 0.05 Hz resolution and 400 kHz bandwidth. The observing frequency was corrected for motions and for the effect of Earth's rotation, which provides a characteristic changing signature for narrow-band signals of extraterrestrial origin. Among the 6×10^{13} spectral channels searched in the northern hemisphere, Horowitz & Sagan reported 37 candidate events exceeding $1.7 \times 10^{-23} \text{ W m}^{-2}$, while in the southern hemisphere from 2×10^{13} channels we found 19 events exceeding the same threshold.

In the Argentinian program, we have also conducted the first high resolution southern target search around 71 stars ($-90^\circ \leq \delta \leq -10^\circ$). We have included "all" stars nearer than 5 pc and of color $+0.6 < B - V < +1.0$ and with spectral class V, that are nearer than 15.5 pc. The observations were performed with the same spectrometer tracking each star at least for 30 minutes.

The third part of the program consisted in observing simultaneously identical celestial coordinates ($-30^\circ \leq \delta \leq -10^\circ$) between both radiotelescopes.

We use the Cordes-Lazio-Sagan Model (1995, ApJ, submitted) to discuss the intermittency of radio signals from extraterrestrial intelligence. The "events" found by Project META can be due to (a) radiometer noise fluctuations, (b) a population of constant galactic sources which undergo deep fading and amplification due to interstellar scintillation, and (c) real, transient signals of either terrestrial or extraterrestrial origin. The Bayesian test shows that hypothesis (b) and (c) are both highly preferred to (a), but the first two are about equally likely.

¹Instituto Argentino de Radioastronomía, Argentina

²Centro de Estudios Avanzados, Universidad de Buenos Aires, Argentina

³Comisión Nacional de Actividades Espaciales, Argentina