

INTERNATIONAL TURBULENCE COMPARISONS IN U.S.S.R.

A comparison of instruments used in the measurement of atmospheric turbulence characteristics was carried out by an international expedition between 15 June and 20 July 1970, in the U. S. S. R. , at the Tsimlyansk Research Station of the Institute of Atmospheric Physics of the Academy of Sciences of the U. S. S. R. (town of Tsimlyansk, Rostov district). The expedition was organized by the meteorological section of the Soviet Geophysical Committee and the Institute of Atmospheric Physics. Scientists from Australia (A. J. Dyer and B. B. Hicks), Canada (M. Miyaki and J. McDonald and others), U. S. S. R. (L. R. Tsvang, S. L. Zubkovskii, B. M. Koprov, A. V. Perepelkina, D. F. Timanovskii and others) and U. S. A. (J. A. Businger, P. Frenzen, C. A. Paulson and others) participated in this expedition. Synchronous measurements were made of the fluctuations of the horizontal and vertical components of wind velocity, temperature and moisture content by means of various instruments which were situated not more than a few tens of cm from each other. The fluctuations of the wind velocity components were measured using acoustic anemometers, I. F. A. * (U. S. S. R.) and Kaijo Denki (Japan), propeller anemometers, C. S. I. R. O. ** (Australia), and miniature cup anemometers, A. N. L. *** (U. S. A.). Temperature fluctuations were measured with acoustic anemometer-thermometers (Kaijo Denki), resistance-wire thermometers (I. F. A.) and thermistor thermometers C. S. I. R. O. (Australia). Humidity variations were measured with a U. V. hygrometer (U. S. A.) and an infrared hygrometer (I. F. A.). At the same time measurements of profiles of temperature and wind velocity were carried out with three separate sets of apparatus (two from the U. S. S. R. , and one from the U. S. A.).

During the expedition a selective statistical treatment of the results of the measurements was carried out with an I. F. A. analogue computer. A preliminary analysis of the results indicates a good agreement between the spectra and relative spectra of the fluctuations of various components of wind velocity, temperature and humidity, measured with the help of various instruments. The treatment and analysis of the results are being continued.

In the course of the expedition numerous simultaneous measurements of the characteristics of turbulence were also carried out in various points of a polygon, 60 metres distant from each other, were also carried out. The results obtained show a good coincidence of the spectra and relative spectra of fluctuations, as well as of the turbulent fluxes of heat and momentum.

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| ** | C. S. I. R. O. | = | Commonwealth Scientific & Industrial Research Organization (Australia) |
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