The Department of Meteorology was visited by Giora G.H Gershtein who is the head of International relations branch in Israel Meteorological Service.

The Israel **Meteorological Service (IMS) is currently carrying on research in the following fields:**

- A numerical forecast of the weather
- A seasonal forecast of precipitation in Israel
- Analysis and mapping of short wave sun radiation and estimating its potential as a source of electrical energy
- Meteorological aspects of air pollution

IMS now runs a regional forecasting model- HRM, based on the German Meteorological Service model for workstations, and adapted by the IMS to the conditions in the Mediterranean. The area of application includes the Red Sea, Egypt and Libya in the south, Greece and the Adriatic Sea in the West, Southern Europe in the north, and Syria and Jordan in the east.

The model has a horizontal resolution of 13km (0.125 degrees) in our region, and includes 38 vertical levels. The model runs for 78 hours twice a day, and its products are at the disposal of the forecasters daily at 06:00 and 18:00. A versatile graphical software interface is used for display, and includes animation for several forecast meteorological parameters in two and three dimensions.

A number of applications have been developed for internal and external clients. Some of the more important products are as follows:

- Presenting time series of forecasted parameters (wind, temperature, and relative humidity, sky coverage with clouds according to their base height, rain and barometric pressure) in various areas and towns in Israel (meteogram).

- Presenting foreword and backward trajectories of air masses.
- Displaying principal characteristics of the
  planetary boundary layer
  (the height of the layer in meters)

Seasonal precipitation forecast

The Meteorological Service has developed a statistical forecast for winter precipitation (the months of December – February), which is based on climatic teleconnections between synoptic properties, deduced from average maps for the month of October, and for seasonal rains. Using a multi-variant regression model, an equation has been developed connecting the forecasted value (the predicted) and the independent variables (the predictors). The values for the predictors are worked out from the American Meteorological Service's reanalysis maps (in the future, these maps will be replaced with their equivalents from the European Center for Medium-Range Weather Forecasting – ECMWF). The forecast results are displayed according to three categories (below average, near average, and above average, whose boundaries have been defined in such a way that they will have an incidence of 33% for the period of the development of the model). Changes in the selection of the predictors that are accompanied by changes in location of the points on the map, from which the values for the predictors are obtained, enable the creation of an ensemble of forecasting results.

The model has been running since the end of the 1980s, and its rate of success (calculated as a Hit Score) ranges between 65% and 70%. The model's forecasting ability compared to simplified climatic models (such as: last year – if the previous year was, for example, rainy, the next two years will be close to average or below average or any other climatic sequence, and more) calculated by Skill Scores, were also satisfactory (values of 0.2 and higher).

Solar Radiation

For the past twenty years, research has been carried out in the field of short-wave solar radiation (0.3-3 microns). These studies focus on examining the distribution of radiation values, and

trends in the climatic changes of the radiation intensity. Simulations were made of solar radiation under a clear sky (with the definition for clear skies based on the ratio between the global radiation and global radiation).

The Meteorological Service cooperates with Ben-Gurion University (the Solar Calculations Unit) in order to analyze and map of the potential to convert solar energy into electrical energy in the Negev region.

In recent years, there have been more studies examining ultra-violet solar radiation in the biological band (UVB). The data analysis has allowed us to improve the ultra-violet forecast index, which is based on the correlation between that band and the short-wave solar radiation values.

The radiation observation station in Sde Boker constitutes, along with 30 other stations spread throughout the world, a part of the BSRN network of stations characterized by high-quality measurements, high levels of accuracy, and whose purpose is to examine changes in climate in various climatic zones (the station characterizes a desert climate). This research is being conducted as part of the WCRP (a climate research program run by the World Meteorology Organization – WMO).

Air Pollution

The Meteorological Service has developed a unique program for forecasting air pollution potential from high-level industrial sources. The program is run as part of the ACC (Alternating Control Center) system, and its results are transferred to bodies supervising power generation stations and the refinery facilities at Haifa, Hadera and Ashkelon.

Also, the Meteorological Service has developed a program for forecasting air pollution from vehicles in the Gush Dan area (central region), that serves the Ministry of Environmental Protection for issuing forecasts, which are distributed through the electronic media