SOLAR AND TERRESTRIAL RADIATION

- Solar Radiation generation and characteristics of the Solar sphere
- Attenuation Procedures of the Solar Radiation on the Atmosphere
- Absorption. Scattering. The contribution of clouds
- Characteristics of the beam, diffused and reflected solar radiation on the ground
- Models of prediction of the Solar Radiation on the ground
- Calculation of the Solar Radiation on various azimuth sloping surfaces ….
- Characteristics of the Terrestrial Radiation
- Terrestrial Radiation Calculation Models
- Transmission of the Terrestrial Radiation in the Atmosphere
- Thermal Results of Solar and Terrestrial Radiation – Thermal balances
- Measurement methods of the components of the Solar Radiation
- Measurement methods of the Solar Radiation
- Calculation works of the Solar and Terrestrial Radiation

ATMOSPHERIC THERMODYNAMICS

- The first and second thermodynamic laws (Thermodynamic variables. Energy conservation: the first law. Entropy and the second law)
- General applications of the first and second thermodynamic laws {Thermodynamic potentials (Internal energy, Enthalpy, Helmholtz free energy, Gibbs function). Heat capacity. Properties of ideal gases. van der Waals' gases. Open systems: enthalpy flux. Potential temperature}
- The atmosphere under gravity (Adiabatic lapse rate. Buoyancy. Dry static energy and Bernoulli function)
- Water in the atmosphere (The Clausius-Clapeyron equation. Calculation of saturated vapour pressure. Humidity variables. Moist static energy)
- Vertical structure of the moist atmosphere (Adiabatic lapse rate for moist air. Entropy budget for saturated air. Finite amplitude instabilities. Vertical structure in thermodynamic diagrams. Convective available potential energy)
- Mixture and solutions (Chemical potentials. Ideal gas mixtures and ideal solutions. Raoult's law. Boiling and freezing of solutions)