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The DSLP Langmuir Probe experiment on-board Proba2: scientific objectives and description

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The Dual Segmented Langmuir Probe (DSLP) experiment on Proba-2 satellite of the European Space Agency is designed for measurements of plasma parameters such as electron density and temperature and in case of known ion composition also ion density. The instrument is a successor of the DEMETER ISL ("Instrument Sonde de Langmuir") experiment, where segmented Langmuir probe concept has been introduced. DSLP uses two identical spherical sensors. Each sensor has seven disc shaped segments and the rest of the spherical sensor, denominated as guard. All of them are mutually independent. The sensors are mounted on opposite corners of a deployable solar panels in a more than one meter distance. The instrument can perform measurements in five different modes. Basic mode measures an I/V curve, from which the electron properties can be computed. This can be processed on all the segments simultaneously to obtain different data sets in respect to plasma flow direction. The I/V curve is given by a current flow through a sensor segment in case of applied sweep voltage. The sweep voltage value can be set up in respect to satellite ground or second sensor. DSLP also measures potential on each sensor either in respect to the satellite or in respect to each other. The description of the DSLP instrument and its parameters is provided.