

## PREFACE to Version 2

In almost two years since the first version was issued, SMILES has seen significant progress in designs of mission instruments and investigations on data analysis. What we expected on SMILES capability has been getting reality through detailed designs and testing results of engineering models. Estimation of data accuracy is also improved by carrying out retrieval simulations, part of which has been conducted in a multi-national collaboration. Scientific discussions have been more focused on potential advantages of SMILES data. This version of SMILES Mission Plan is issued to cover those progresses. Nevertheless, we admit the contents remain short of full satisfaction. Any critical comments will be invaluable for us to make our ways toward the launching of SMILES.

Further information about the SMILES mission including the updated version of this document can be found at the following URL.

<http://smiles.tksc.nasda.go.jp/indexe.shtml>

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## PREFACE to Version 1

A proposal of Superconducting Submillimeter-wave Limb-emission Sounder (SMILES) was approved in April 1997 as an experiment on the JEM Exposed Facility. The SMILES experiment has twofold mission objectives: to demonstrate new technology of submillimeter-wave sensor for sounding the middle atmosphere, and to provide scientists with global data of trace gases that are deeply connected to the ozone depletion. The SMILES mission team, which was formed as a joint collaborative group between the National Space Development Agency of Japan (NASDA) and Communications Research Laboratory (CRL), has been concentrating on the technical development of critical components and the design of the whole SMILES system. Although there still remain several unresolved technical problems, the SMILES system is taking shape and seems promising for the mission objectives.

Meanwhile, Japanese researchers in the field of atmospheric sciences have been collaborating with the mission team on critical discussions concerning the mission capabilities for maximizing scientific returns. The discussion has been performed in a working group, the SMILES Science Team, under the Committee for Earth Observation Systems, Earth Science and Technology Forum. This report is a summary of the discussion, which clarifies the fundamental requirements on the SMILES mission, specifically from the scientific viewpoints. Now we believe that SMILES could be a powerful probe for atmospheric researches, if these requirements are met.

We hope this report is read by many people including atmospheric scientists worldwide. Any critical comments on the contents of this report will be appreciated. We will continue our efforts for improving the SMILES instrumental specifications and maximizing the scientific outputs of this challenging mission.

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