The SwRI Solar Instrument Pointing Platform (SSIPP): First flight and current status

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The SwRI Solar Instrument Pointing Platform (SSIPP) is a low-cost solar observatory designed specifically to lower barriers to entry for novel suborbital solar experiments. Traditional platforms such as standalone balloon payloads or unmanned suborbital instruments require years of effort to design, in large part because of the high cost of traditional suborbital flights. SSIPP provides a pointed, controlled solar beam ranging from near-infrared to near ultraviolet, onto a small optical table on which a temporary instrument can be built up; this separates the need for vehicle and "observatory" development from the instrument itself.

SSIPP is a miniaturized observatory, approximately $100 \times 70 \times 70$ cm in size. The primary telescope is a Maksutov-Cassegrain telescope, which looks through a fast steering mirror at the Sun. An image sensor at prime focus picks off four small regions of the solar limb, which are used to control the steering mirror. The remainder of the solar beam passes, untouched, into the instrument.

Originally conceived as a payload for manned sounding rockets, SSIPP has been redesigned as a balloon payload. This required several changes, including development of a novel coarse steering system (SCAMP). SCAMP makes use of the spring dynamics of the suspension ladder, to steer the payload rapidly without use of a reaction wheel. SSIPP flew under a World View balloon, in 2016 September, achieving partial success. We report on the results of this first flight, and current status of the follow-on SSIPP payload scheduled to re-fly in Summer 2018.

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