

## SWISS NATIONAL REPORT

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The exploration of the “second solar spectrum” with ZIMPOL (Zurich Imaging Polarimeter) has continued with observing runs at the National Solar Observatory (Kitt Peak and Sacramento Peak). An observing run in October 1997 focused on the examination of a number of “null lines” that should not be polarizable except by lower-level atomic polarization created by depopulation optical pumping. During an observing run in March 1998 we explored the detailed behavior of the center-to-limb variation of the enigmatic Na I D<sub>1</sub> and D<sub>2</sub> polarized line profiles. The analysis and interpretation of these observations are still in progress.

While the first generation of ZIMPOL has continued to be used for these observing programs, the second generation, ZIMPOL II, has been under development, but it is now nearing its completion. First results of successful test observations carried out with ZIMPOL II at IRSOL in Locarno have been reported at the 2nd International Workshop on Solar Polarization in Bangalore in October 1998. Two half-wave ferroelectric liquid crystal modulators are used, sandwiched between two  $\lambda/8$  plates. This allows all four Stokes parameters to be modulated with high efficiency at 1 kHz. As there are no moving parts, and all four image planes use the identical pixels, a Stokes vector image is obtained that is entirely free from both seeing and flat-field effects in the fractional polarization.

At IRSOL in Locarno (under the direction of M. Bianda) the program to systematically explore the Hanle effect with a beam splitter based polarimeter has been continued. With several hundreds of recordings of the Stokes  $I$ ,  $Q$ , and  $U$  parameters in the Sr II 4078 and Ca I 4227 Å lines at various locations on the quiet solar disk it has been possible to construct “Hanle histograms” that can be used to derive information on both the spatially unresolved and partially resolved weak magnetic fields outside the supergranulation network. Observations of the full Stokes vector in active regions have illustrated how the Hanle and Zeeman effects mix, and how the Hanle depolarization in Stokes  $Q$ , the Hanle rotation in Stokes  $U$ , and the longitudinal Zeeman effect in Stokes  $V$ , can exhibit strong spatial variations over a few arcsec.

### 2. Institute of Applied Physics of the University of Berne

The start of operation of our imaging spectrographs in Argentina (El Leoncito) has suffered a long delay due to customs. We hope to start flare observations at El Leoncito with the spectrographs and the new Submm-telescope in 1999.