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Sodium and potassium lidar system and preliminary result in Brazil

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This paper reported that the first sodium and potassium lidar was built at November, 2016 in INPE(S23°,W45°) by National Space Science Center, Chinese Academy of Sciences. This system first time realized the potassium and sodium metal layer at the same time above the detection In South America. The lidar system use a powerful pulse YAG laser to pumped two dye lasers at the same time, and join the advanced technology, such as narrow line-width grating technique, efficient laser frequency doubling technique, wavelength automatic locking technique and the double optical fiber in the focal plane for spectra separation technique and so on, which made the 589 nm and 770 nm laser line width to achieve 0.03cm-1 and the laser frequency doubling efficiency to reached above 65%. In this way, the simultaneously detecting the atmosphere at the altitude of 80∼110 km by sodium and potassium fluorescence in one lidar facility has been realized. On November 20, 2016, this system began to observation for the first time in Brazil, and it has the detection data of South America about potassium and sodium at the same time. Observed data show that sodium echo photon counting rate is higher than 31874count/160s/96m, potassium echo photon counting rate is higher than 2153count/320s/96m. Comparing with both of at home or abroad, the results are a very good. In particular, the detection results level of potassium take the leading position in the international.