

## CHARACTERISTICS OF SPORADIC SODIUM LAYERS AT 23 °S

DALE SIMONICH, Barclay Clemesha and Paulo Prado Batista

Instituto Nacional de Pesquisas Espaciais, São José dos Campos, SP, Brasil

Emails: [simonich@laser.inpe.br](mailto:simonich@laser.inpe.br), [BRC@laser.inpe.br](mailto:BRC@laser.inpe.br), [PPBatista@laser.inpe.br](mailto:PPBatista@laser.inpe.br)

We have analyzed 22 years (1987 to 2008) of mesospheric sodium measurements, searching for possible long-term changes in the characteristics of sporadic sodium layers (narrow layers of enhanced sodium standing out from the background layer). During these years the vertical resolution of our lidar was either 0.25 or 0.3 km. Initially each candidate layer had height and density digitized for the two background points and the layer peak. A program was then run which allowed the input of criteria for the selection of sporadic layers from the candidate layers organizing the results into 3 groups: all data, seasonal and biennial (2-year averages). For the strength factor (ratio of the peak amplitude to the average background) of the all data group, the most frequent value was 3 with almost 40% of the layer strengths falling between 2.5 and 3.5. For greater strengths the occurrence rate decreased logarithmically (log of occurrence rate decreasing linearly with increasing strength factor) up to a strength factor of about 14, after which it leveled off. For the seasonal group, the results are similar with winter having the steepest slope, followed by fall, and spring and summer being similar with the least slope. For the biennial group, 1987-2000 were similar with steeper slopes as compared to 2001-2008. With respect to the width of the sporadic layers, we find maximum occurrence for a width of 1.25 km, with 35% between 1.125 and 1.375 km. and then decreasing logarithmically to 4.75 km. The seasonal data was essentially the same for all seasons, and the biennial had no consistent behavior. A comparison of the average peak height for the sporadic and normal layer shows a somewhat similar behavior but with the normal height about 2 to 3 km lower than the sporadic. The preferred sporadic layer peak height for all the data was 93 km. The number of layers per hour for all data was close to 0.6 from 1800 LT to midnight, decreasing to about 0.3 at 0600 LT. Our daytime data is sparse, but it appears that the occurrence rate is roughly constant during the day, up to 1500 LT, after which it increases to its nighttime value.

LIDAR, Sporadic sodium, Mesosphere

Dale Simonich, Instituto Nacional de Pesquisas Espaciais, Av. dos Astronautas, 1758, São José dos Campos, SP, Brasil; Telephone: +55-12-3945-6954, Fax: +55-12-3945-6954, emails: [simonich@laser.inpe.br](mailto:simonich@laser.inpe.br), [dale.simonich@vivax.com.br](mailto:dale.simonich@vivax.com.br)