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A new multi-year database of current sheets at 1AU

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We announce the first open access multi-year database of current sheets systematically identified with the one second cadence at 1 AU. The current sheet list comes from an automated method of current sheet identification that suggests a formalization of the long-time experience of observers in the visual finding of CSs based on the analysis of the IMF and plasma parameters that vary sharply at CSs of different origins in the solar wind (Behannon et al. 1981; Blanco et al. 2006; Zhang et al. 2008; Suess et al. 2009; Simunac et al. 2012; Zharkova and Khabarova, 2012, 2015; Khabarova et al. 2015, 2016; Khabarova and Zank 2017; Malova et al. 2017; Adhikari et al. 2019). The main features seen with a resolution not worse than one minute that may characterize a CS crossing are as follows: (i) a decrease in the IMF magnitude B , (ii) a decrease in V_A/V (V_A is the Alfvén speed and V is the solar wind speed), and (iii) an increase in the plasma beta (the ratio of the plasma pressure to the magnetic pressure). Since the automatization of the CS recognition process requires setting the same rules for CSs occurring in different plasmas under different conditions, normalization should be performed. After obtaining B , V_A/V , and β with a one second cadence, we calculate their one-second derivatives. Spikes of the derivatives occurring out of the noise level indicate the CS location. Only the spikes that appear simultaneously in dB/dt and any of two other parameters are considered as pointing out the CS location. The database is available at ***csdb dot izmiran dot ru***