MHD simulation of current sheet creation above a bipolar active region

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The numerical experiment has been carried out for creation a current sheet in the corona above a bipolar active region at appearance of two new solar spots. All spots are collinear. The experiment demonstrates appearance of two fronts with increased density that are situated on the border of the emerged magnetic flux. One of them is associated with current sheet generation. In the magnetic field of this current sheet energy is accumulated for a solar flare. The second front is a branch of density disturbance that separates the new and old magnetic fields of the same direction. The development of this disturbance is not produce energy accumulation in the corona. Its appearance produces difficulty of preflare state observation and is complicated analysis of observation results. The second front can be considered as a filament eruption. The Peresvet code is used for solving the system of MHD equation. It is a conservative relative to the magnetic flux. It suppresses the numerical instability that appears because of a strong magnetic field gradient on the photospheric boundary.