## Q22c Three-dimensional MHD Simulations of the Parker Instability with Cooling/Heating Effects

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We performed three-dimensional numerical simulations of Parker instability taking into account the cooling/heating functions (Inoue et al. 2006) of the interstellar medium. In our two-dimensional simulation, when magnetic field is strong (Pgas/Pmag smaller than 1), dense filamentary clouds are formed at the valley of magnetic field lines where the interstellar gas sliding down along the undulating magnetic field accumulates. In three-dimension, the dense cloud may drop down toward Galactic plane due to magnetic Rayleigh-Taylor instability and pull magnetic field lines into vertical direction. We expect that dense cold clouds are formed below thin nonthermal filaments where electrons are accelerated at shock waves formed between dense vertical filaments and supersonically infalling gas. This model may explain the nonthermal filaments observed at Galactic center region where the magnetic field line are vertical to the Galactic plane.