MAGNETOROTATIONAL PROCESSES IN CORE COLLAPSE SUPERNOVAE

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We consider magnetorotational (MR) processes in core collapse and supernova explosion. The collapse of the rotating iron core isn't uniform. In the process of the core collapse its rotation becomes differential. Differential rotation leads to the amplification of toroidal component of magnetic field. At the initial stage the toroidal component of the magnetic field is amplifying linearly with the time.However at the developed stage it starts to grow exponentially. Poloidal components also grow exponentially. It is explained by magnetorotational instability. When the magnetic pressure becomes strong enough it forms compression wave. The compression wave quickly transforms to the fast MHD shock. The MHD shock moves outwards and leads to the supernova explosion. Our 2D simulation shows that explosion energy can reach up to 2.5×10^{51}erg what corresponds to observational data.