

## THE INFLUENCE OF SPIRAL ARMS AND BAR ON THE LARGE-SCALE GALACTIC MAGNETIC FIELD EVOLUTION

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Recent observations of radio polarization from nearby galaxies show that the large-scale galactic magnetic field is aligned with spiral arms and bars and the magnetic field vectors in the interarm regions possess a spiral structure which has the same pitch angle as that in spiral arms. Our present project is going to address the following questions: **What is the structure and evolution of the large-scale galactic magnetic field under the influence of spiral and bar structure in a galactic disk? To which extent could the resulting magnetic field account for the observed spiral pattern of magnetic field in nearby galaxies?** The model is based on the particle-particle numerical scheme (SPH) involving two components: stars and molecular gas. The magnetic field is connected with the latter one. The magnetic field computations were performed first in two dimensions for 100 velocity fields: from  $10^7$  to  $10^9$  yrs. The resultant magnetic field is strongly affected by spiral arms, however at the given evolutionary stage its structure is different from the velocity field at the same time. The magnetic pitch angle distribution shows that the magnetic field "remembers" all the past velocity steps. The magnetic pitch angle distribution resulting after beam smoothing could quite well fit observations. The present model with fully 3D velocity field of interstellar gas should clear the problem if the magnetic field under the realistic velocity evolution of gas could explain the observed structure of large-scale magnetic field with constant pitch angle in the whole disk.