Robust reduction of image artefacts in echo-planar Magnetic Resonance Imaging at 7 Tesla small animal scanner.

At the Department of Circulation and Medical Imaging (ISB) there is a 7 Tesla MRI scanner, recently upgraded with new hardware and software for faster and better imaging. One important application at this scanner is socalled Echo-Planar -Imaging (EPI), today used primarily for diffusion tensor imaging. Currently the method is suffering from varying degree of an image artefact we call ghosting, which effectively renders the images useless in many situations. The principal origin of the image artefact is well understood. However, the specific methods applied for ghost correction at the 7 Tesla scanner is not well described.

The project goal is to optimize the acquisition and reconstruction parameters of the EPI-sequence in order to obtain robust ghost correction. The project will involve both experiments and simulations, and possibly programming/implementation of reconstruction algorithms with ghost correction in matlab. The student will develop knowledge in MR-physics and improved programming skills, as well as hands-on experience with MR scanning. On successful completion, the project will make an important impact on the image quality at the 7 Tesla small-animal scanner.

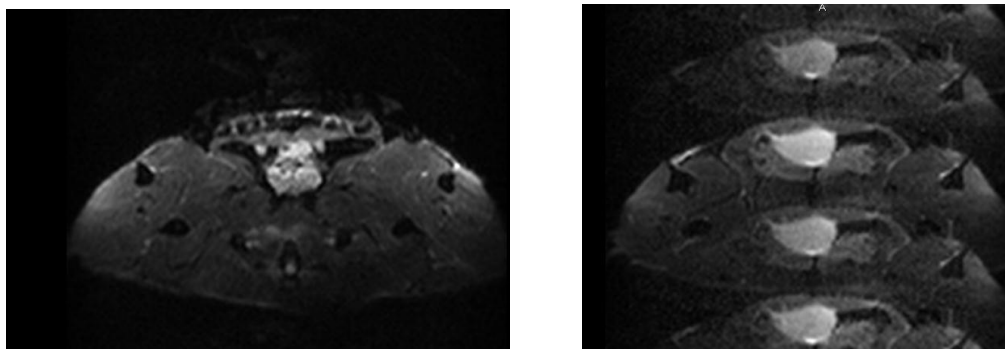For more information, contact assoc. prof. Pål Erik Goa, pal.e.goa@ntnu.no, office D4-160.

Figure 1. Example MR images of mouse, free of artefact (left) and with ghosting artefact (right).