

## AbstractID: 4594 Title: The Impact of Sparse Data Sets on the Quality of MR Images

**Purpose:** To evaluate the impact of reduction in acquired data size on the final appearance of MR images and to assess the synergetic impact of image interpolation, used in softcopy viewing, on the perception of image quality.

**Method and Materials:** A rapid progress in signal quality of the MRI data acquired with modern MRI hardware, coupled with a desire to speed up the acquisition times as much as possible, promotes a practice where drastic reductions in the size of acquired data are implemented by the MRI system operator. Routinely, the physician viewing the MR images is presented with incomplete and confusing information about the true size of the acquired data. Most physicians are oblivious to the potential impact of complex acquisition algorithms on the quality of images. The situation is further confounded by various image interpolation techniques used by softcopy display systems.

A standard spin echo imaging sequence (270/10, FOV 30 cm, slice thickness 5 mm, gap 5 mm, 11 slices, 1 NEX, BW=2\*15.63 kHz) was used to generate a baseline image with 256\*256 acquisition matrix. This was followed by an acquisition of a 512\*512 image that served as a "golden reference standard", given the fact that the standard MR displays use 512\*512 image size as a default. The baseline protocol was then repeated by varying options and parameters that affected the sizes of the acquisition matrix, processing matrix, or display matrix.

**Results:**

Images other than the golden reference standard exhibit artifacts whose strength strongly depends on the resampling algorithm applied. The extent and severity of observed artifacts increases with the number of options used to generate the image.

**Conclusion:**

The image acquisition parameters and display resampling algorithms need to be carefully accounted for when evaluating image artifacts in MR images.

**Conflict of Interest (only if applicable):**