

**AbstractID: 1578 Title: Reproducibility of multislice spiral CT scans**

For the image reconstruction of a CT scan at any position, transmission measurements from all x-ray source angles are needed at that position. At spiral CT missing projections are calculated by means of interpolation, using measurements at positions nearby. This procedure may lead to interpolation artifacts. The relationship between the x-ray source angle and the spiral reconstruction artifacts is investigated here. The angle of the x-ray source at the starting scan position varies and can not be chosen. The angle is only known after the scan has been made. We determine and quantify the influence of this phenomenon on the reproducibility of CT scans. Reproducible spiral CT scans are required when image processing such as subtraction or masking is used. We used a head phantom consisting of a human skull in a synthetic material and a CT scanner with four detector arrays. We made series of scans of the same region with all adjustable scan parameters kept constant in order to obtain a collection of different values for the starting x-ray source angle. Series were made for different pitch values. We conclude that in general images of a spiral CT scan are not reproducible. Only if the x-ray source starting angle is equal for both scans or if a very low pitch is used, images are highly reproducible. Under other circumstances interpolation artifacts show up differently in otherwise identical images, and show up as substantial residual artifacts when for example subtractions are made.