AbstractID: 11073 Title: An algorithm for metal streaking artifact reduction in cone beam CT

Purpose: To develop a metal streaking artifact correction for cone beam CT (CBCT) and to evaluate its effect on image quality. **Method and Materials**: A small water phantom with steel cylinders, a large solid water phantom with contrast inserts and steel cylinders and a GYN patient with a metallic vaginal cylinder were scanned on a CBCT scanner with an amorphous silicon flat panel detector. CBCT images were reconstructed in three different ways: using the CBCT scanner reconstruction algorithm, using an in-house reconstruction algorithm, both on the basis of the original projections and using our reconstruction algorithm with based on modification of projection data. First, metal traces were identified in either the projection space or the image space. The projection areas corresponding to the metals were deleted and replaced by interpolated data from the neighboring projections. **Results**: Identification of metal traces worked very well for the phantoms and the patient. In the case of the small phantom, the scanner reconstructed images suffered from severe artifacts that were reduced when the CBCT images were reconstructed by the in-house reconstruction algorithm. CBCT images using the interpolated projections were nearly artifact free in both phantoms. The corrected image of the large phantom closely resembled the CBCT image without metals. The original patient CBCT images showed streaking artifacts in the proximity of the vaginal cylinder that were significantly reduced after the correction algorithm was applied. A coronal slice at the position of the cylinder clearly demonstrated the improvement in image quality. **Conclusions**: The quality of CBCT images was greatly improved using the projection interpolation algorithm in both the phantoms and the patient. The successful test of the correction algorithm applied on CBCT images of the large phantom and in the complex patient anatomy offers the possibility to use the correction for patients with hip prostheses.