RV and one direction flow structure; 3) the cardiac coronary component consti-
tuted of acryl/silicon tube (2-5 mm inner diameter) with stent/in-stent restenosis/ stenosis/soft plaque. Calculation parts and one direction flow structure; 4) the only one servomotor to move the phantom in 3D dimensions (X-Y-Z direction) and to get one direction flow of phantom and coronary; 5) 16 presets of different heart type is easy for multipurpose experiments; and 6) the all cardiac phantom and coronary phantom was submerged in tank to simulate clinical state.

Results: The comparison of cardiac MR and cardiac MDCT was demonstrated by using a developed pulsating cardiac flow phantom. For evaluation of cardiac image we: 1) show cardiac image quality of MR and MDCT; and 2) show coronary image quality of MR and MDCT.

Conclusion: We have designed and constructed a new pulsating heart phantom, and it is very useful for comparison between cardiac MR and cardiac MDCT.

C-699
Initial study of a CT QA-method to determine spatial variation in X-ray focus position (flying focus and collimation) and CT gantry vibrations

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Purpose: Investigate the impact of variation in X-ray focus position on gantry vibrations.

Methods and Materials: A rotation-independent detector is used to measure the spatial dose distribution on the falling slope of a dose profile free from scatter. Since the detector is very thin (approximately 300 µm) the spatial modulation of the X-ray beam can be seen when the beam moves in and out on the detector. The source for this modulation could be a flying focus and/or vibration of the gantry in z-direction. The frequency and spatial movement can be determined by a detail study of an enlarged part of the slope. Since the spatial movement is determined in isocenter and the distance to the focus point is known, the effective movement in z-direction can be determined at the detector plane. A Baracuda equipped with the MPD and the SEM module was used together with the CT-SDI-16 dose profile detector (RTI Electronics AB). The RTW analyzer program 0-10-56 was used to collect high-speed/high resolution dose profile data points for further zoom and FFT analyze.

Results: Practical measurements were made and a vibration frequency and movement were observed. A similar method has been used to determine the effect of “flying focus” on Siemens sensation 64. If the movement is a too large movement were observed. A similar method has been used to determine the effect of “flying focus” on Siemens sensation 64. If the movement is too large, the movement can be determined in isocenter and the distance to the focus point is known, the effective movement in z-direction can be determined at the detector plane. A Baracuda equipped with the MPD and the SEM module was used together with the CT-SDI-16 dose profile detector (RTI Electronics AB). The RTW analyzer program 0-10-56 was used to collect high-speed/high resolution dose profile data points for further zoom and FFT analyze.

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C-700
A new method for quantitative evaluation of artifacts on CT images using statistics of extremes
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Purpose: Several methods of quantifying spatial resolution power and image noise of CT exist. However, the method for quantitative assessment of artifacts on CT images has not yet been clarified. In this study, we have devised the new evaluation method for artifacts on CT images using “statistics of extremes”.

Methods and Materials: A chest phantom was prepared. Four polymer tubes filled with water were placed on the chest wall of the phantom to evaluate artifacts in homogeneous backgrounds. CT scans were performed using a 16-multi-
detector row CT scanner with 0.5-second gantry rotation period, 10 mA, and 120 kVp. A CT value profile of a tube image for each slice was measured at one-pixel intervals in the perpendicular direction to the artifacts. The largest variation in a profile curve was employed as a feature index of the artifact, and was calculated from each profile. The feature indices for a tube image were analyzed with statistics of extremes, and the artifacts were evaluated based on this analysis.

Results: The generation-probability density function of artifacts f(x) were ex-
pressed as f(x)=(1/a)exp((-x/a)+(1/a)x/a)((1-a)/(1-a)) (x: feature index, a: scale param-
eter, : location parameter). Therefore, generation-probabilities of artifacts were found to be governed by Gumbel distribution. A feature index yielding the highest generation-probability and a scale parameter describing the variation in feature indices were calculated from this function. Three two parameters showed high values on CT image including shoulders and a liver.

Conclusion: Our devised method would make it possible to evaluate artifacts on CT images quantitatively.