## AbstractID: 12822 Title: Volumetric Density Analysis Using Automated Whole Breast Ultrasound

**Purpose:** To estimate the volumetric breast density by using the new three-dimensional (3-D) ultrasound technique, automated whole breast ultrasound (ABUS), was proposed in this paper. **Method and Materials:** In this study, the ABUS and MRI data were obtained from 40 patients. The ABUS images were acquired by the ABUS machine using the 10 MHz linear transducer with width 14.7cm. Although the ABUS can scan the larger area of breast automatically, two to five passes of scanning are necessary to completely scan the whole breast. In this study, two passes are used to cover the whole breast. The volumetric data contain serial 2-D 548×348 slices with 16, 35, and 76 pixels/cm in the transverse, longitudinal, and coronal directions, respectively. Because the overlapping regions should be calculated only once in the density analysis, a vertical line across the nipple to cut the overlapping region in each image. Moreover, the non-breast region below the retromammary fat should not be included in the density analysis. Hence, the lowest horizontal plane was manually selected to cut the non-breast region. After segmenting the breast region, the fuzzy c-mean (FCM) classifier was used to differentiate the fibroglandular and fatty tissues in the ABUS and MRI images. The percent density and fibroglandular tissue volume were compared and correlated in both imaging modalities with the linear regression analysis. **Results:** The density of 3-D ABUS and MRI images for different BI-RADS categories of images was analyzed and the correlation factor R<sup>2</sup> was up to 0.760. The volumes of ABUS and MRI images are also compared and their correlation factor R<sup>2</sup> is 0.835. **Conclusion:** ABUS and MRI have high positive correlation for breast density quantification and both of them could provide the useful breast density information to physicians.