

# AbstractID: 10920 Title: The Characterization of Iodinated-Contrast Kinetics Using a Dynamic Breast Phantom

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**Purpose:** To demonstrate the effectiveness of contrast-enhanced dual energy mammography (CEDEM) in characterizing the contrast kinetic curve.

**Method and Materials:** The acquisition of CEDEM was performed using a dedicated cone-beam breast CT scanner in our laboratory, with the system operating in stationary imaging mode. CEDEM images were acquired with a filter combination of 0.2 mm Cu and 0.2 mm Sn at the same kVp. Previous studies in our group have shown that 55 kVp is the optimal technique factor to acquire high-quality CEDEM images when imaging a 6-cm, anatomical-complex breast phantom. As an addition to the static breast phantom, a tumor perfusion chamber was designed and fabricated to simulate the contrast kinetics of breast tumors. The chamber is composed of a "leaky" vessel (soaker hose) and the tumor interstitial space (foam). The contrast kinetics was controlled by two peristaltic pumps, the "leakiness" of the soaker hose, and the permeability of the foam. When imaged experimentally, the tumor perfusion chamber was fixed in the middle of the static breast phantom. A sequence of CEDEM images were acquired with an initial bolus injection of 100 ml Visipaque®. The contrast kinetics was determined by evaluating the signal-to-noise ratio of each dual-energy subtracted image as a function of time.

**Results:** The CEDEM image sequence of the dynamic breast phantom was acquired at 55 kVp. The contrast kinetic curve was found to follow closely that of human subjects. The influence of the phantom parameters on the kinetic curve will be presented. The contrast kinetic curve modeling benign and malignant tumors using this phantom will be presented.

**Conclusion:** The contrast kinetic curve was evaluated using a dynamic breast phantom. CEDEM was found to be effective in characterizing the contrast kinetic curve around breast tumors.