

# **Kemiringan Gantry Menggunakan Fantom Polymethyl Methacrylate (PMMA) Kepala**

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## **Abstrak**

Tujuan dari penelitian ini adalah untuk mengembangkan metode otomatis guna memvalidasi kemiringan gantry pada computed tomography (CT). Metode otomatis ini menggunakan fantom kepala polymethyl methacrylate (PMMA) dengan diameter 16 cm. Sudut kemiringan gantry diukur secara manual dan otomatis. Pengukuran manual dilakukan dengan mengukur diameter anterior posterior (AP) dan diameter lateral (Lat) dari gambar yang diperoleh menggunakan kaliper elektronik. Pengukuran otomatis terdiri dari sejumlah langkah yaitu: segmentasi fantom, penentuan pusat fantom, pengukuran diameter anterior posterior (AP) dan diameter lateral (Lat) dan perhitungan sudut kemiringan gantry. Metode ini dihitung pada sudut gantry dari  $0^\circ$ ,  $5^\circ$ ,  $10^\circ$  dan  $15^\circ$ . Diperoleh hasil bahwa metode otomatis yang dikembangkan dapat mengukur sudut gantry kemiringan gantry dengan akurat. Perbedaan antara sudut gantry yang dihitung secara otomatis dan sudut yang kurang dari  $1^\circ$ .

**Kata kunci** : Computed Tomography, Kemiringan Gantry, Fantom polymethyl methacrylate (PMMA), metode otomatis, Quality Control

# **Gantry Tilt Using Fantom Polymethyl Methacrylate (PMMA) Head**

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## **Abstract**

The purpose of this study was to develop an automatic method for validating the computed tomography gantry tilt. A head polymethyl methacrylate fantom with a diameter of 16 cm was used. Gantry tilt angles were measured both manually and automatically. Manual measurements were performed by measuring the length of the anteroposterior and lateral diameters from acquired images using electronic calipers. Automatic measurements consisted of a number of steps: fantom segmentation, determination of the center of the fantom, measurement of the anteroposterior and lateral diameters, and computation of the gantry tilt angle. The method was implemented on the gantry angles from  $0^\circ$  to  $15^\circ$ . The proposed method of measuring gantry angles produced accurate gantry tilt angles. The differences with the angles displayed on the gantry were less than  $1^\circ$ .

**Keywords:** Computed tomography, gantry tilt, polymethyl methacrylate fantom, automated method, quality control.

## **Pembimbing Akademik**

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