

What You Need to Know: AAPM Task Group-218

AAPM Task Group-218¹ is a guideline outlining Patient Safety standards for pre-treatment measurements.

It promotes error detection by **recommending 3D measurements** that can find errors anywhere in the patient volume, and **recommending against 2D Perpendicular Composite measurements** that don't sample the entire volume – and may mask clinically impactful errors.

Perpendicular Composite measurements represent any planar measurement that compresses all fields into one plane, and are also known as Single Gantry Arc Composite (SGAC).

AAPM TG-218 states:

- "IMRT QA measurements should not be performed using the PC (Perpendicular Composite) delivery method which is prone to masking delivery errors."
- "The PC method has the distinct disadvantage of potentially masking errors due to the summation."

"Although all per-beam planar IMRT QA had high Gamma passing rates...there were significant errors in some of the calculated clinical dose metrics"

Using a Novel Dose QA Tool to Quantify the Impact of Systematic Errors Otherwise Undetected by Conventional QA Methods: Clinical Head and Neck Case Studies

MF Chan, et al, *Technol Cancer Res Treat.* 2014 Feb;13(1):57-67

What Meets the Recommendations of TG-218

Any 3D measurement solution that closely simulates actual patient treatment delivery, including:

- ArcCHECK®
- Software that allows 3D measurements*, such as SunCHECK™ Patient - PerFRACTION™

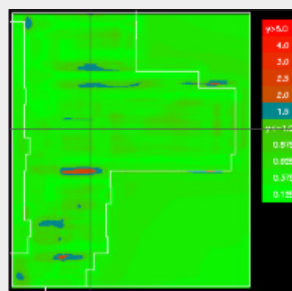
These types of solutions enable more comprehensive error detection and support structure-based treatment analysis -- essential to continuous improvement in Radiation Therapy.

"...detector devices designed to measure VMAT beams such as ArcCHECK or Delta4 generally sample the entire beam area..."

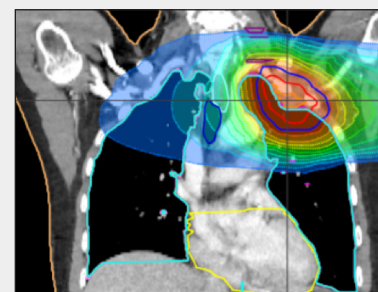
"Using the EPID to obtain an integrated image (2D composite image) for VMAT is considered Perpendicular Composite."

Tolerance limits and methodologies for IMRT measurement-based verification QA: Recommendations of AAPM Task Group No. 218
M Miften, et al, *Med. Phys.* 45 (4), April 2018

2D Perpendicular Composite vs. 3D Measurement



2D Composite - Masks errors



3D Measurement - Clear display of dose to each organ

*Mobius 3D does not meet ASTRO/ACR guidelines requiring a phantom measurement. ASTRO 2016 Users Guide: "There are a number of products that support calculation based IMRT validations ("software" calculation measurement); however, these do not satisfy the current requirements". PerFRACTION provides a variety of measurement and analysis options, including 3D techniques, allowing physicists flexibility to perform QA to their requirements.

1: <https://www.ncbi.nlm.nih.gov/pubmed/29443390>