

Regional Radiation Protection Service

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Signal to Noise Ratio

This measurement gives an indication as to the overall performance of the scanner. In accordance with IPEM report 112, variations of less than 10 % are considered acceptable.

If measurements fall outside of this tolerance, this implies either an inconsistency in acquisition parameters, uneven loading or a genuine issue with the scanner. If determined to be a genuine issue with the scanner, a decrease in SNR can be indicative of:

- Increased noise levels due to e.g interference, coil element coupling or broken coil element
- Decreased signal levels due to poor B0 shim, issues with transmit gain or overall degradation of the system

	Axial	Sagittal	Coronal	Average SNR	Baseline SNR	Deviation from baseline (%)
Inbuilt Transmit -Receive Coil	122.62	123.04	117.56	121.07	1.0	12007.33
Head & Neck Coil	455.32	469.04	447.8	457.39	2.0	22769.33
Flexible Phased Array Anterior Coil	448.1	448.37	420.91	439.13	3.0	14537.56

Uniformity

This measurement gives an indication as to the overall performance of the imaging gradients and the homogeneity of the main magnetic field.

In accordance with the ACR Phantom Test Guidance PIU should be greater than or equal to 87.5%% for MRI systems with field strengths less than 3 Tesla. PIU should be greater than or equal to 82.0%% for MRI systems with field strength of 3 Tesla. If measurements fall outside of this tolerance, this implies an issue with:

- Poor B0 shim
- Poor B1 shim
- Coil element failure/cross-talk
- Uneven or incomplete loading

	Axial	Sagittal	Coronal	PIU
Inbuilt Transmit-Receive Coil	[92.16]	[87.14]	[80.78]	86.69
Head & Neck Coil	[76.59]	[72.28]	[66.35]	71.74
Flexible Phased Array Anterior Coil	[63.55]	[61.65]	[86.99]	70.73

Slice Thickness

This measurement gives an indication as to the overall performance of the imaging gradients and the homogeneity of the main magnetic field.

In accordance with IPEM report 112, variations of less than 0.7 mm for a prescribed slice thickness of 5 mm is acceptable. If measurements fall outside of this tolerance, this implies an issue with:

- Imaging gradient non-linearity
- Poor B0 shim

	Axial	Sagittal	Coronal	Average	Deviation from prescribed (mm)
Inbuilt Transmit-Receive Coil	[5.77]	[4.14]	[4.29]	5	0
Head & Neck Coil	[5.62]	[3.89]	[4.56]	5	0
Flexible Phased Array Anterior Coil	[5.56]	[3.94]	[4.2]	5	0

Geometric Accuracy

:

- Imaging gradient non-linearity
- Poor B0 shim

	Axial	Sagittal	Coronal	Average	Deviation from actual length(mm)
Inbuilt Transmit-Receive Coil	176.26999999999998	176.0275	175.2925	175.86	2.863333333333344
Head & Neck Coil	177.0	174.80499999999998	175.7825	175.86	2.862499999999983

Flexible Phased Array Anterior Coil	178.70999999999998	175.7825	174.315	176.27	3.269166666666621
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