

Accelerating 3D Imaging with Fast 3D

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Fast 3D Technology

Canon's Fast 3D technology allows acceleration of up to 50% for 3D imaging. These images can be reconstructed into any plane that can further reduce exam time.

- **Multiple:** Multiple parallel slice encoding lines, at a value of 1.5 or 2.0, are acquired continuously in a single shot. Multiple is suitable for acquiring T2W, STIR, FLAIR, and similarly weighted images when using 3D FASE sequences.
- **Wheel:** Signals are acquired at the center of the k-space in a deformed wheel pattern in the phase-encoding and slice-encoding planes. This selection is suitable for image types such as T1, PD, and T2 weighted imaging.
- **Advanced Fourier Imaging (AFI):** An advanced reconstruction technique using part of the data set when filling k-space. The incomplete data is compensated using the symmetrical characteristic of conjugate complex numbers of k-space before reconstruction.

Fast 3D for FASE 3D and mVox

Multiple and Wheel modes of Fast 3D are available when imaging FASE 3D sequences with and without mVox (MPV).

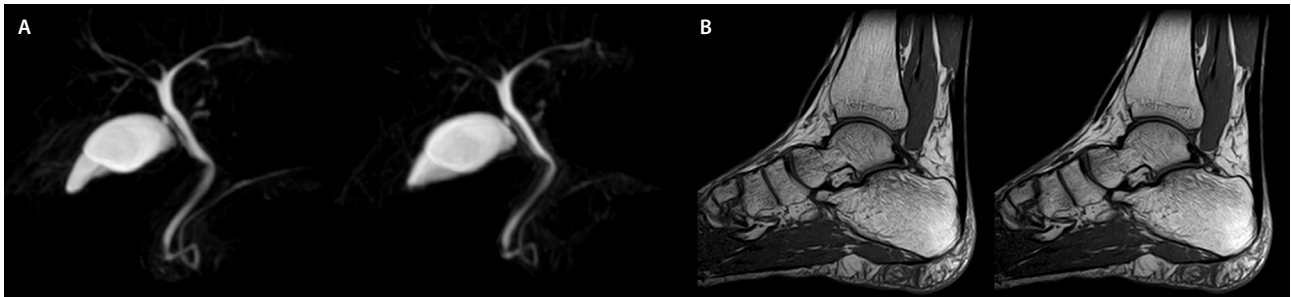


Figure 1

(A) FASE 3D sequence for MRCP exam without (left) and with FAST 3D (right) at 50% scan time reduction. (B) FASE 3D with mVox sequence for sagittal T1 without (left) and with FAST 3D (right) at 50% scan time reduction.

Fast 3D for ToF

Wheel Fast 3D mode is available in 3D TOF MR Angiography sequences.

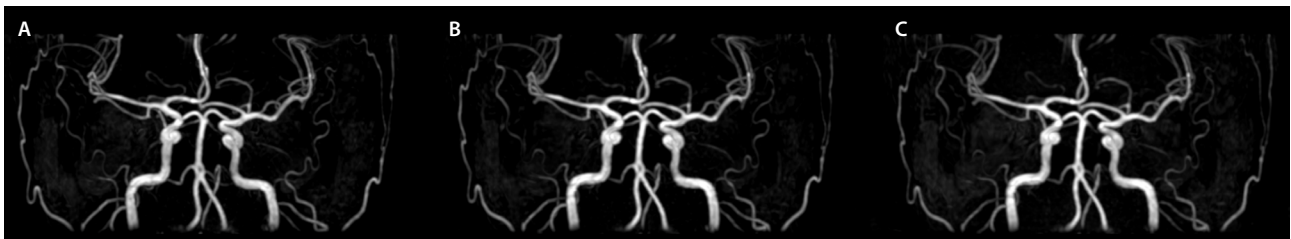


Figure 2

(A) Circle-of-Willis 3D TOF with Speeder only. (B) and (C) are 3D TOF with FAST 3D at 40% and 50% scan time reduction, respectively.

Fast 3D for SSFP 3D

Wheel Fast 3D mode is available in SSFP 3D sequences. This is suitable for scanning relatively longer T2 tissues such as CSF, synovial fluid, vascular structures, and non-contrast Time-SLIP imaging.

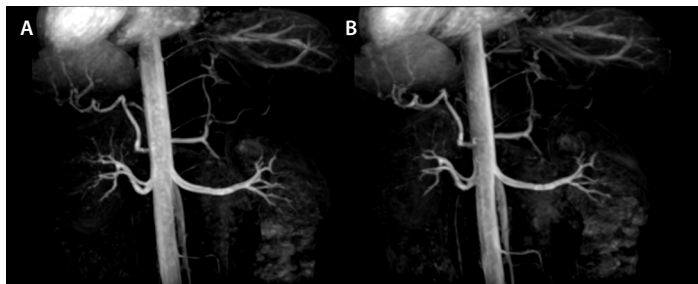


Figure 3
SSFP 3D Time-SLIP imaging for non-contrast abdominal vasculature without (A) and with FAST 3D (B) at 50% scan time reduction.

Fast 3D for FFE 3D

Wheel and Wheel + AFI Fast 3D modes are available in FFE 3D sequences.

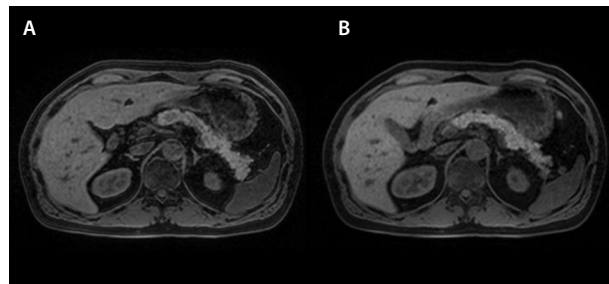


Figure 4
Abdominal breath-hold FFE 3D imaging without (A) and with FAST 3D (B) at 25% scan time reduction.

Fast 3D for FE 3D

Wheel Fast 3D mode is available in FE 3D sequences.



Figure 5
Sagittal T1 FE 3D with Speeder only (A), with FAST 3D at 35% (B) and 50% (C) scan time reduction.

Fast 3D and 3D Compressed Speeder (CS)

Fast 3D can be combined with 3D CS for sequences that are compatible with 3D CS such as FASE 3D and FFE 3D.



Figure 6
FASE 3D sequence for MRCP exam without (A), with FAST 3D (B) at 50% scan time reduction, and when combining FAST 3D and 3D CS (C) at 65% scan time reduction.

Fast 3D and AiCE

Fast 3D can be combined with Canon's deep learning reconstruction technology (AiCE), in which 3D sequences can be scanned in a shorter scan time and with better image quality compared to conventional acquisitions.

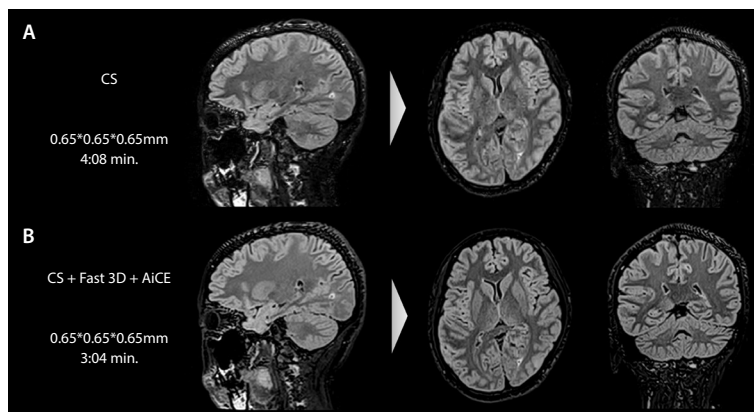


Figure 7
(A) Sagittal T2 FLAIR at 0.65mm3 isotropic resolution with CS only along with its axial and coronal MPR acquisitions. (B) Same scan parameters with FAST 3D at 26% scan time reduction, and with a better image quality compared to (A) when combined AiCE.

For more details, please refer to Canon Medical Systems USA, Inc. website or contact your local Canon representatives.

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