

# Expert Insights: Hidden Gems from Application Specialists at Siemens Healthineers

## Khaled Khames on the Trigger Delay parameter

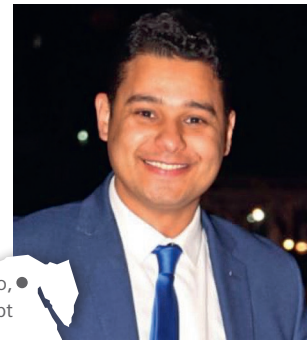
### Khaled Khames

Khaled Khames is a physicist in Cairo, Egypt. He is passionate about training clinical staff on new MR technologies to help build MR expertise and practices that achieve the best outcomes for patients and optimal performance for healthcare providers.

Khaled enrolled in a Bachelor of Science in 2006, at the Department of Physics at Ain Shams University in Cairo. He went on to work as a physicist in a diagnostic nuclear medicine unit. When he discovered MRI, however, he was fascinated by the evolving technology and the challenges it solved, all of which inspired him to embark on a career in the MR field.

This path eventually led him to Siemens Healthineers, where he became Senior Application Specialist for Egypt, Sudan, Libya, Eritrea, and Djibouti in 2015. He is also an instructor at the Siemens Healthineers Academy in Egypt, where he teaches basic and advanced MR courses for physicians and technologists.

Khaled received the Learn Passionately Award 2023 at the Egypt Mid-Year townhall meeting. Outside of work, he loves spending time with his three daughters and going fishing.



Cairo, Egypt

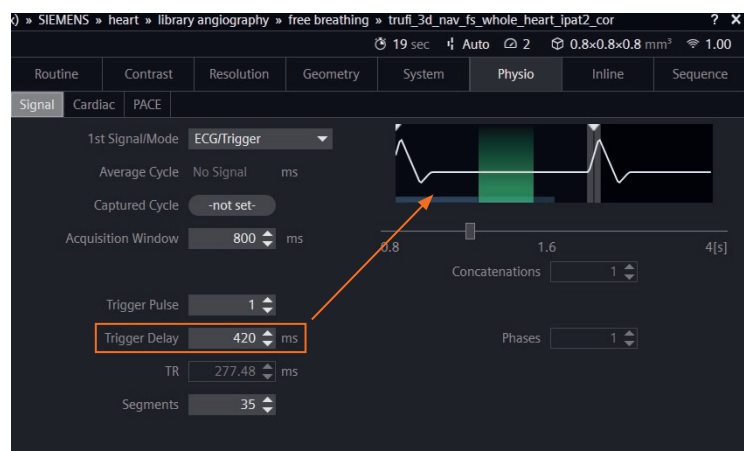
### Contact

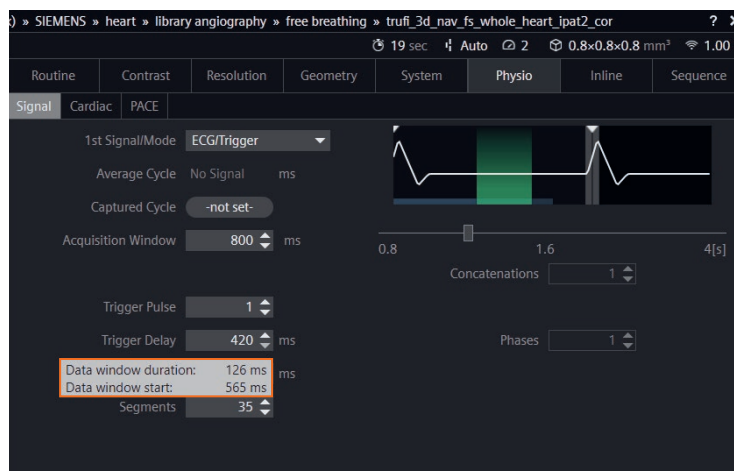
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## My favorite feature ...

... is the Trigger Delay parameter, to achieve motion artifact free images in the heart region. You can use it to optimize image quality in noncontrast-enhanced MR angiography when using a triggered 3D TrueFISP or FLASH sequence – to image the whole heart, coronaries, or the aorta.

The Trigger Delay should be set in such a way, that the region of interest is in a quiet phase, i.e., not much heart motion or flow happening during data acquisition.





This quiet phase can be identified by a visual assessment of cine or flow images from the corresponding region. Scroll through the cine images and identify the quiet phase, ideally with starting and end point and the length in ms. The TT (Trigger Time) can be found in the image text on the left side.

With this knowledge you can now individually optimize the parametrization of the 3D sequence to the patients' condition on the parameter card Physio/Signal.

Before you start editing, hover with the mouse cursor over the Trigger Delay parameter to visualize the information of the Data window start and the Data window duration.

Adapting the Trigger Delay shifts your Data window start. (Cave: Additional Prep Pulses are added to the Trigger Delay for the Data window start point, such that the shown Trigger Delay in the user interface (UI) is not corresponding to the Data window start).

Adapting the number of segments modifies the Data window length. Modifying the number of segments has an impact on the Data window duration and the total acquisition time.

Number of segments ↑  
Data window duration ↑  
Total acquisition Time ↓

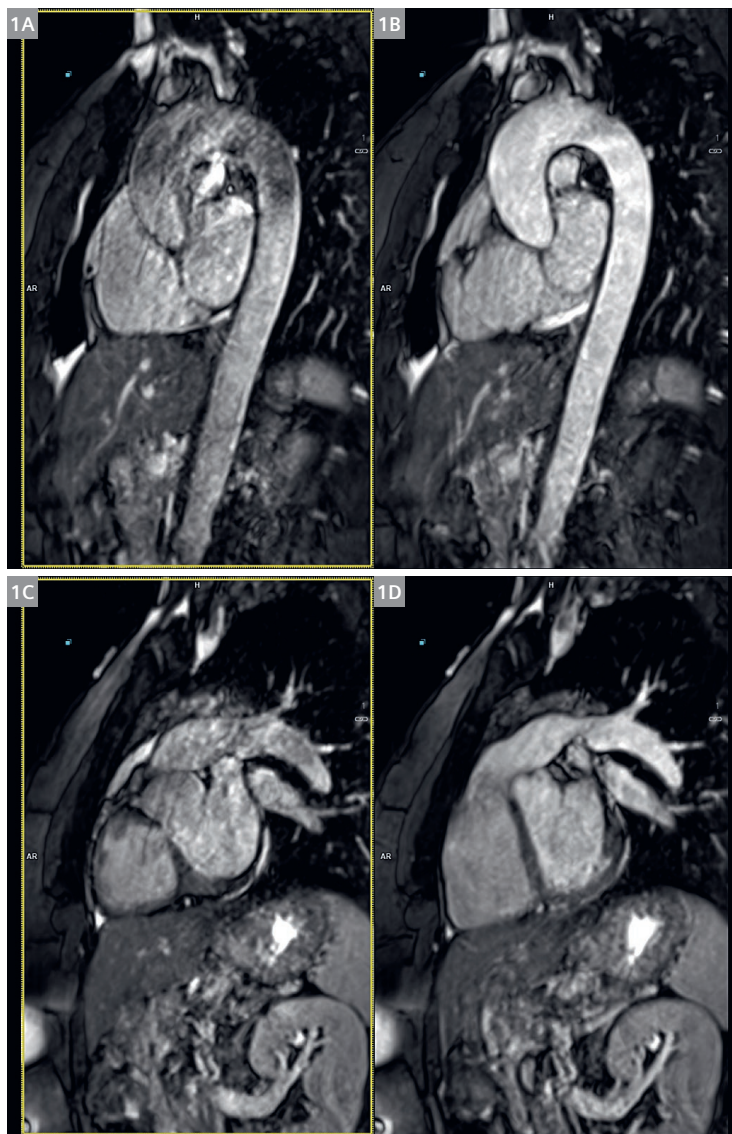
Number of segments ↓  
Data window duration ↓  
Total acquisition Time ↑

It is recommended to use a Data Window duration between 100 and 180 ms to keep motion and flow artifacts minimal.

Cave: Use a consistent trigger source. If you use e.g., Beat Sensor for cine imaging, make sure to use Beat Sensor for 3D imaging, too.

## Acknowledgments

I would like to acknowledge the fruitful conversations with Manuela Rick, Senior Applications Developer, Erlangen, Germany



**1** Noncontrast triggered 3D TrueFISP  
(1A) Suboptimal Trigger Delay time, (1B) Appropriate Trigger Delay time,  
(1C) Suboptimal Trigger Delay time, (1D) Appropriate Trigger Delay time