

## **Respiratory gating: cardiovascular and body imaging**

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### **Highlights**

- Respiratory gating using navigator echoes is highly effective in many cardiovascular and body MRI applications
- Physiological motion self-gating MRI is an emerging alternative to navigator echoes

### **Target Audience**

Scientists and clinicians with basic knowledge of MRI physics who either conduct research to address motion problems in MRI or use MRI for clinical studies where motion is a concern.

### **Introduction**

The purpose of this lecture is to summarize most common methods for motion gating and compensation in cardiovascular and body MRI applications. In these applications, respiratory motion often causes significantly image degradation and artifacts. Typical motion gating methods include navigator echoes (NAV), respiratory bellows and MRI self-gating. NAV is a 2D localized excitation of a pencil beam at the liver-lung interface, the position of which is used to gate the acquisition of the MRI data. Respiratory bellows are air-filled pillows that are typically placed at the subject's abdomen or chest. The respiratory motion of the subject causes a pressure change in the bellow, which is used for gating the motion. MRI self-gating is an emerging technique where the motion-gating signal does not come from external device or the NAV, but rather from an MR imaging signal itself. Self-gating has certain nice features that make it desirable for a number of applications. Each of the three main types of methods has its pros and cons, which will be discussed during the lecture. In addition to respiratory motion, self-gating is also capable of detecting and gating the cardiac motion. This could be useful for applications where ECG signal is either degraded by interference of the MRI environment or not readily available.

### **References**

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