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## Cardiac MRI Circular Tagging

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### INVENTORS

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### OTHER INFORMATION

#### KEYWORDS

CMR, cardiovascular magnetic  
resonance imaging, cardiac MRI  
tagging

#### CATEGORIZED AS

▶ [Imaging](#)  
▶ [Medical](#)

#### RELATED CASES

[2011-457-0](#)

## SUMMARY

UCLA researchers in the Department of Radiology have developed a cardiac Magnetic Resonance Imaging (MRI) tagging system that is more adaptive to the natural geometry and biomechanics of the heart for effectively measuring parameters such as cardiac wall thickening and radial strain.

## BACKGROUND

Cardiac MRI tagging is a promising technique for noninvasively studying regional heart wall motion. To implement, tags are first formed in the myocardium using spatially dependent excitation methods and then a sequence of images are acquired at various phases of the cardiac cycle. Currently, tagging is implemented in the Cartesian coordinate system in which the gradient fields create only parallel taglines.

Although Cartesian tagging is most widely implemented, myocardium strain is conventionally presented in the polar coordinate system because it adapts best to the morphology and mechanics of the heart. Further, if tagging patterns were in either the radial or circumferential directions, as opposed to the Cartesian direction, strain calculations would be simplified.

## INNOVATION

Researchers at UCLA have developed a novel and robust circular tagging method for cardiac MRI with high spatial resolution and tagline density that allows for effectively measuring and calculating cardiac wall thickness, myocardial shear rate and angular strains.

## APPLICATIONS

- ▶ Included as part of the cardiac package of MRI systems
- ▶ Assessment of myocardium function by observing wall thickening and/or wall motion

## ADVANTAGES

- ▶ Compatible with the heart's morphology and movement
- ▶ Does not distort taglines
- ▶ Measurements are in the form necessary for today's clinical practice
- ▶ Adaptive to simpler mathematical algorithms for automatic calculations

## STATE OF DEVELOPMENT

Researchers have developed and tested the method on phantom as well as healthy volunteers and have received IRB approval for testing on patients.

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,933,502	04/03/2018	2011-457

## RELATED MATERIALS

- ▶ [CMR Tagging in the Polar Coordinate System.](#)

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