

# An Efficient MR Method for the Mapping and Measuring of Venous Oxygenation Using VSEAN

Published date: Feb. 1, 2012

## Technology description

### Summary

Oxygen consumption of the brain, measured by oxygen extraction fraction (OEF) provides important quantitative information on brain health and function. OEF is the fraction of the oxygen in arterial blood that is removed when the blood flows through a capillary bed. It is determined by subtracting SvO<sub>2</sub> (venous oxygen saturation) from SaO<sub>2</sub> (arterial oxygen saturation). SaO<sub>2</sub> can readily be measured using a pulse oximeter. High OEF with reduced cerebral blood flow (CBF) depicts the at-risk tissue in acute stroke. OEF together with CBF can be used to obtain cerebral metabolic rate of oxygen (CMRO<sub>2</sub>), which provides an additional important quantitative assessment of brain metabolism and function. Despite the importance of OEF and CMRO<sub>2</sub> for clinical uses and basic neuroscience studies, a robust SvO<sub>2</sub> mapping and measuring technique amenable to functional and clinical MRI has not been established.

### Description

UC San Diego researchers have developed a robust MRI method for mapping/measuring venous oxygenation non-invasively.

### Advantages

The method uses velocity selective excitation with arterial nulling (VSEAN) to increase signal-to-noise ratio (SNR) and reduce imaging time by effectively separating the venous blood signal from the arterial blood signal and static tissue signal.

The innovations include:

Velocity-selective excitation (VSE) pulses to image moving magnetization only.

Combination of VSE pulses with arterial nulling (AN) to acquire venous blood signal exclusively.

Combination of VSEAN and T<sub>2</sub> prepared or multi-echo T<sub>2</sub> measurement to map the venous T<sub>2</sub> and oxygenation.

Institution

[University of California, San Diego](#)

## 联系我们



叶先生

电话 : 021-65679356

手机 : 13414935137

邮箱 : yeyingsheng@zf-ym.com