

## Accepted Manuscript

Simultaneous acquisition for  $T_2 - T_2$  Exchange and  $T_1 - T_2$  correlation NMR experiments

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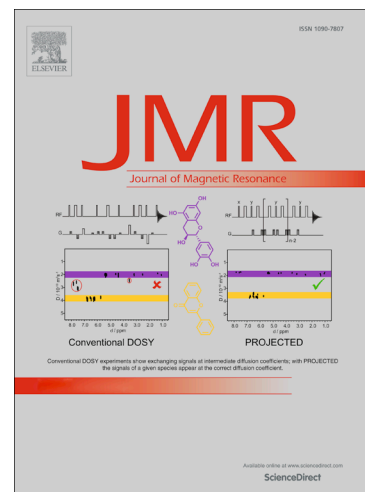
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2 Simultaneous acquisition for  $T_2$ - $T_2$  Exchange and  $T_1$ - $T_2$   
3 correlation NMR experiments

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8 **Abstract**

9 The NMR measurements of longitudinal and transverse relaxation times and  
10 its multidimensional correlations provide useful information about molecular  
11 dynamics. However, these experiments are very time-consuming, and many  
12 researchers proposed faster experiments to reduce this issue. This paper presents  
13 a new way to simultaneously perform  $T_2$ - $T_2$  Exchange and  $T_1$ - $T_2$  correlation  
14 experiments by taking the advantage of the storage time and the two steps  
15 phase cycling used for running the relaxation exchange experiment. The data  
16 corresponding to each step is either summed or subtracted to produce the  $T_2$ -  
17  $T_2$  and  $T_1$ - $T_2$  data, enhancing the information obtained while maintaining the  
18 experiment duration. Comparing the results from this technique with traditional  
19 NMR experiments it was possible to validate the method.

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20 **1. Introduction**

21 The measurement of longitudinal ( $T_1$ ) and transverse relaxation times ( $T_2$ ),  
22 as well as the ratio  $T_1/T_2$ , has been routinely used for the identification of dif-  
23 ferent molecular species and on the study of the molecular diffusion of confined  
24 fluids in porous media. [1, 2, 3]

25 The development of fast data processing algorithms such as the fast two-  
26 dimensional inversion of Fredholm integral (2D-IFI), also known as fast two-

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