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Brittle rotational faults and the associated shear heating

Soumyajit Mukherjee, M.M. Khonsari

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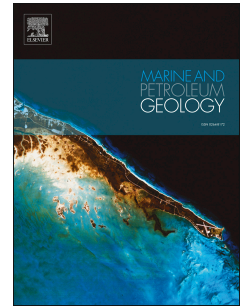
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# 1 Brittle rotational faults and the associated shear heating

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3 Soumyajit Mukherjee<sup>1\*</sup>, M. M. Khonsari<sup>2</sup>

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5 1. Department of Earth Sciences, Indian Institute of Technology Bombay, Powai, Mumbai 400  
6 076, Maharashtra, INDIA7 2. Department of Mechanical and Industrial Engineering, Louisiana State University, Baton  
8 Rouge, LA 70803, USA9 *\*Corresponding author: [soumyajitm@gmail.com](mailto:soumyajitm@gmail.com)*

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## 11 Abstract

12 Brittle faulting-related shear heating is important in petroleum geosciences, tectonics and seismic  
13 studies. Temporal variation of shear heat related temperature rise for rotational and roto-  
14 translational faults are investigated in this work. For planar fault planes, devoid of gouge and any  
15 secondary faulting, temperature rise is proportional to the coefficient of friction, and rate of  
16 (angular) slip. Tectonically realistic physical parameters for rotational faults, especially  
17 prolonged faulting, can significantly increase temperature by shear heating at shallow crustal  
18 depth, capable of thermal maturity of hydrocarbons.

19

20 **Keywords:** brittle shear; frictional heating; rotational fault; structural geology; tribology

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## 23 Introduction

24 Brittle fault planes are discussed ideally, under the general category of “non-rotational faults” or  
25 “translational faults”, as having equal magnitude of net slip at every point along the fault trend.

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