



# INTERREG project

## *Les Sprays*



**Whilst gratefully acknowledging the financial support of INTERREG project,**

**Has INTERREG made any real difference in the way we work and research?**



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## **Diesel sprays formation and penetration:**

Experiment and modelling at ICEG

- Thiesel 2006, Spain, Sept 2006
- Krakow, Poland May 2006

## **Autoignition of fuel vapour: the Shell model**

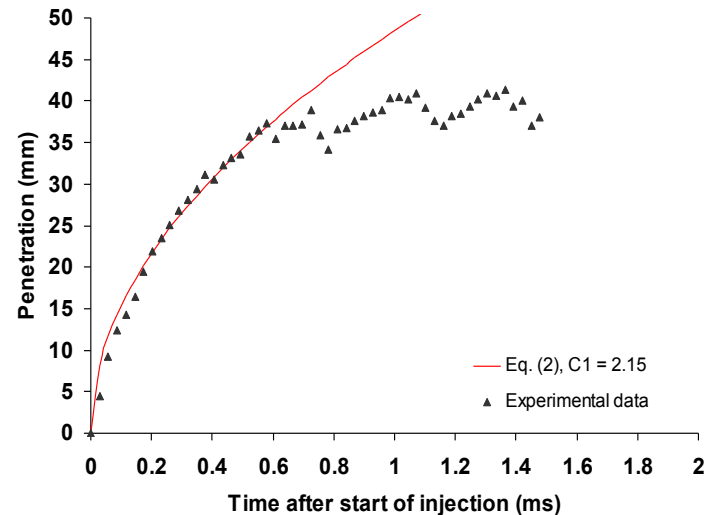
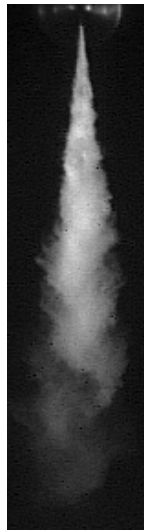
- Automotive fuels: modelling the experiment at University of Lille, France
- Forest fires: INTAS workshop, Russia, May 2006

## Developments in Diesel Spray Characterisation and Modelling

K. Karimi, E M. Sazhina, W. A. Abdelghaffar, C. Crua, T. Cowell, M R. Heikal, M R. Gold

School of Engineering, University of Brighton, Brighton UK

Ricardo Technical Centre, Bridge Works, Shoreham-by Sea, West Sussex, BN43 5FG



**PTNSS CONGRESS-2007 B07-C165**

**Split Injection Strategy for Diesel Sprays: Experiment and  
Modelling**

**K. Karimi, C. Crua, M R. Heikal, E M. Sazhina**

**ICEG, School of Engineering, University of Brighton, Brighton  
UK**

**Krakow, Poland**

**May 2007**

# **INTERREG Monitoring Meeting**

## **Rouen July 2006:**

### **Cross-pollination of ideas**

- Constructive discussions of the experiment and modelling for sprays
- Reformulation of the model for Centre-of-Mass penetration following the feedback from the meeting

## Future work

### **Positive feedback at the PTNSS Congress**

from Professor Jan Macek, Vice-Dean for R&D  
Josef Bozek Research Centre,  
Czech Technical University, Prague  
in reference to their paper:

### **Fuel Injection Process Computations Using the Eulerian Multidimensional Model**

*by Marcel Diviš, Jan Macek*

**The ICEG experiment and modelling are useful  
for their Computational Fluid Dynamics work**



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## **AUTOIGNITION OF *n*-PENTANE IN A RAPID COMPRESSION MACHINE: EXPERIMENT *versus* MODELLING**

- **M. Ribaucour, R. Minetti, E.M. Sazhina, S.S. Sazhin**
- **1** Physico-Chimie des Processus de Combustion et de l' Atmosphère, UMR 8522 CNRS
- **2** Université des Sciences et Technologies de Lille, Bâtiment C11, 59655 Villeneuve d' Ascq cedex, France;  
Université d'Artois, Parc Porte Nord, 62700 Bruay la Buisnière, France
- **3** School of Engineering, Faculty of Science and Engineering, University of Brighton, Brighton, U.K.



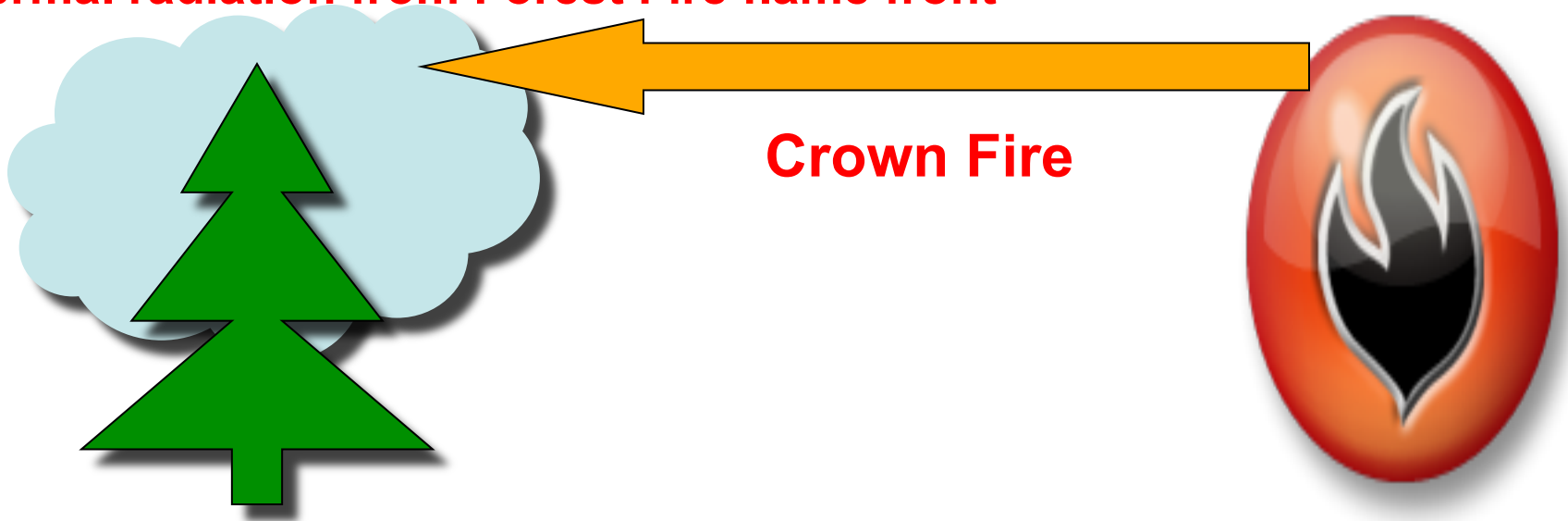
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## Autoignition of hydrocarbon vapour: the Shell model for...

Forest fires: INTAS workshop, Russia, May 2006

**Autoignition of Products of Pyrolysis of trees tops when heated by thermal radiation from Forest Fire flame front**





Workshop INTAS – Siberian Branch  
Of the Russian Academy of Sciences  
Scientific Cooperation and Collaborative Call  
10-12 May 2006  
Novosibirsk, Russia

## **Mathematical modeling of forest fire initiation and spread**

V.A. Perminov, E.M. Sazhina

Kemerovo State University, Russia  
School of Engineering, University of Brighton, UK

**Abstract:** A mathematical model for description of heat and mass transfer processes at crown forest fire initiation and spread is developed. It is assumed that the forest can be modelled as a two-temperature multiphase non-deformable porous reactive medium during a forest fire.

The applicability of the Shell autoignition model to the description of ignition of gaseous products of pyrolysis of forest materials is explored. The Shell model accounts for the continuous chemical heat release prior to the ignition (including cool flames) while being less CPU intensive than detailed kinetic mechanisms (DKM) of autoignition.



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**Dissemination for wider audiences;  
Public lectures at**

- **House of Commons, 2006**
- **University Centre Hastings**



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**INTERREG has made real difference in the way we work and research, by**

- **opening pastures new for research**
- **enabling cross-pollination of research ideas**
- **dissemination of knowledge to wider audiences**