

汽车工程系

DEPARTMENT OF AUTOMOTIVE ENGINEERING

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### 教育背景

1995年—1998年, 华中科技大学内燃机专业读博士

1986年—1989年, 华中科技大学内燃机专业读硕士

1982年—1986年, 华中科技大学内燃机专业读本科

### 工作经历

2006年-今, 清华大学汽车工程系教授

2007年-2008年, 美国威斯康星大学访问学者

2001年-2002年, 德国亚琛工业大学访问学者

2000年-2006年, 清华大学汽车工程系副教授

1998年-2000年, 清华大学汽车工程系博士后

1989年-1995年, 南昌矿山机械研究所工程师

### 学术兼职

中国汽车工程学会代用燃料汽车分会副主任委员

中国内燃机学会油品与清洁燃料分会秘书长

中国内燃机协会理事

《汽车安全与节能学报》编委

### 研究领域

发动机流动、喷雾和燃烧数值模拟

发动机替代燃料

发动机排放后处理



### 奖励与荣誉

2012年获中国内燃机学会“突出贡献奖”

2008年“满足国4排放标准的车用燃油技术指标研究”获国家环保局环境保护科学技术二等奖

2007年“汽车尾气催化器评价试验和匹配优化技术”获北京市科技进步二等奖

2005年获清华大学青年教师教学优秀奖

1992年“039潜艇进、排气系统与柴油机最佳匹配计算的研究”获中国船舶工业总公司科技进步二等奖

## 学术成果

### 教材、译著及专利

王建昕, 帅石金编著. 汽车发动机原理. 北京: 清华大学出版社, 2011

Frank Zhao编著, 帅石金译. 汽油车近零排放技术. 北京: 机械工业出版社, 2010

帅石金编著. 汽车文化(第二版). 北京: 清华大学出版社, 2007

### 发明专利8项

### 发表论文

累计发表中英文核心期刊论文130余篇, 其中SCI、EI检索80多篇。

代表性论文:

1. Fan Zhang, Shijin Shuai, Zhi Wang, Xia Zhang, Jianxin Wang. A detailed oxidation mechanism for the prediction of formaldehyde emission from methanol-gasoline SI engines. *Proceedings of the Combustion Institute*, Volume 33, Issue 2, 2011, Pages 3151-3158.

2. Xiao Ma, Xu He, Jian-xin Wang, Shijin Shuai. Co-evaporative multi-component fuel design for in-cylinder PLIF measurement and application in gasoline direct injection research. *Applied Energy*, Volume 88, Issue 8, August 2011, Pages 2617-2627.

3. Dong-bo Yang, Zhi Wang, Jian-Xin Wang, Shi-jin Shuai. Experimental study of fuel stratification for HCCI high load extension. *Applied Energy*, Volume 88, Issue 9, September 2011, Pages 2949-2954.

4. F. Liu, X. He, X. Ma, Q. Zhang, M.J. Thomson, H. Guo, G.J. Smallwood, S. Shuai, J. Wang. An experimental and numerical study of the effects of dimethyl ether addition to fuel on polycyclic aromatic hydrocarbon and soot formation in laminar coflow ethylene/air diffusion flames. *Combustion and Flame*, Volume 158, Issue 3, March 2011, Pages 547-563.

5. Zhi Wang, Xu He, Jian-Xin Wang, Shijin Shuai, Fan Xu, Dongbo Yang. Combustion visualization and experimental study on spark induced compression ignition (SICI) in gasoline HCCI engines. *Energy Conversion and Management*, Volume 51, Issue 5, May 2010, Pages 908-917.

6. Shijin Shuai, Neerav Abani, Takeshi Yoshikawa, Rolf D. Reitz, Sung Wook Park. Evaluation of the effects of injection timing and rate-shape on diesel low temperature combustion using advanced CFD modeling. *Fuel*, Volume 88, Issue 7, July 2009, Pages 1235-1244.

7. Shijin Shuai, Neerav Abani, Takeshi Yoshikawa, Rolf D. Reitz, Sung Wook Park. Simulating low temperature diesel combustion with improved spray models. *International Journal of Thermal Sciences*, Volume 48, Issue 9, September 2009, Pages 1786-1799.

8. Wenmiao Chen, Shijin Shuai, Jianxin Wang. A soot formation embedded reduced reaction mechanism for diesel surrogate fuel. *Fuel*, Volume 88, Issue 10, October 2009, Pages 1927-1936.

9. Yitao SHEN, Shijin SHUAI, Jianxin WANG, Jianhua XIAO. Optimization of gasoline hydrocarbon compositions for reducing exhaust emissions. *Journal of Environmental Sciences*, Volume 21, Issue 9, 2009, Pages 1208-1213.

10. Fujia Wu, Jianxin Wang, Wenmiao Chen, Shijin Shuai. A study on emission performance of a diesel engine fueled with five typical methyl ester biodiesels. *Atmospheric Environment*, Volume 43, Issue 7, March 2009, Pages 1481-1485.

11. Jianxin Wang, Fujia Wu, Jianhua Xiao, Shijin Shuai. Oxygenated blend design and its effects on reducing diesel particulate emissions. *Fuel*, Volume 88, Issue 10, October 2009, Pages 2037-2045.

12. Hongyi Dong, Shijin Shuai, Rulong Li, Jianxin Wang, Xiaoyan Shi, Hong He. Study of NO<sub>x</sub> selective catalytic reduction by ethanol over Ag/Al<sub>2</sub>O<sub>3</sub> catalyst on a HD diesel engine. *Chemical Engineering Journal*, Volume 135, Issue 3, 1 February 2008, Pages 195-201.

13. Hu Chen, Jianxin Wang, Shijin Shuai, Wenmiao Chen. Study of oxygenated biomass fuel blends on a diesel engine. *Fuel*, Volume 87, Issues 15-16, November 2008, Pages 3462-3468.

14. Xiaoyan SHI, Yunbo YU, Hong HE, Shijin SHUAI, Hongyi DONG, Rulong LI. Combination of biodiesel-ethanol-diesel fuel blend and SCR catalyst assembly to reduce emissions from a heavy-duty diesel engine. *Journal of*

Environmental Sciences, Volume 20, Issue 2, February 2008, Pages 177-182.

15. Hu Chen, Shuai Shi-Jin, Wang Jian-Xin. Study on combustion characteristics and PM emission of diesel engines using ester-ethanol-diesel blended fuels. Proceedings of the Combustion Institute, Volume 31, Issue 2, January 2007, Pages 2981-2989.

16. Changbin Zhang, Hong He, Shijin Shuai, Jianxin Wang. Catalytic performance of Ag/Al<sub>2</sub>O<sub>3</sub>-C<sub>2</sub>H<sub>5</sub>OH-Cu/Al<sub>2</sub>O<sub>3</sub> system for the removal of NO<sub>x</sub> from diesel engine exhaust. Environmental Pollution, Volume 147, Issue 2, May 2007, Pages 415-421.

17. Jianxin Wang, Shijin Shuai, Hu Chen. Application and Development of Biomass Fuels for Transportation in China. Tsinghua Science & Technology, Volume 12, Issue 2, April 2007, Pages 223-230.

18. Zhi Wang, Shi-Jin Shuai, Jian-Xin Wang, Guo-Hong Tian. A computational study of direct injection gasoline HCCI engine with secondary injection. Fuel, Volume 85, Issues 12-13, September 2006, Pages 1831-1841.

19. Xiaobing Pang, Xiaoyan Shi, Yujing Mu, Hong He, Shijin Shuai, Hu Chen, Rulong Li. Characteristics of carbonyl compounds emission from a diesel-engine using biodiesel-ethanol-diesel as fuel. Atmospheric Environment, Volume 40, Issue 36, November 2006, Pages 7057-7065.

20. Xiaoyan Shi, Xiaobing Pang, Yujing Mu, Hong He, Shijin Shuai, Jianxin Wang, Hu Chen, Rulong Li. Emission reduction potential of using ethanol-biodiesel-diesel fuel blend on a heavy-duty diesel engine. Atmospheric Environment, Volume 40, Issue 14, May 2006, Pages 2567-2574.

21. Shi, Y. Yu, H. He, S. Shuai, J. Wang, R. Li. Emission characteristics using methyl soyate-ethanol-diesel fuel blends on a diesel engine. Fuel, Volume 84, Issues 12-13, September 2005, Pages 1543-1549.

22. Shi-Jin Shuai, Jian-Xin Wang. Unsteady temperature fields of monoliths in catalytic converters. Chemical Engineering Journal, Volume 100, Issues 1-3, 15 July 2004, Pages 95-107.

23. Bang-Quan He, Shi-Jin Shuai, Jian-Xin Wang, Hong He. The effect of ethanol blended diesel fuels on emissions from a diesel engine. Atmospheric Environment, Volume 37, Issue 35, November 2003, Pages 4965-4971.

总浏览数: 9209520

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