



Novosibirsk State  
Technical University  
**NETI**

# **Science или Nature? Рекомендательная система выбора журнала для научной публикации**

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Новосибирск, 2022



## **Иванов Иван Владимирович**

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научный сотрудник лаборатории  
Функциональных материалов НГТУ

диссертация (2020 год) связана с анализом  
больших объёмов экспериментальных  
данных и результатов моделирования

# Немного о наукометрии

## Показатели уровня крутизны журнала

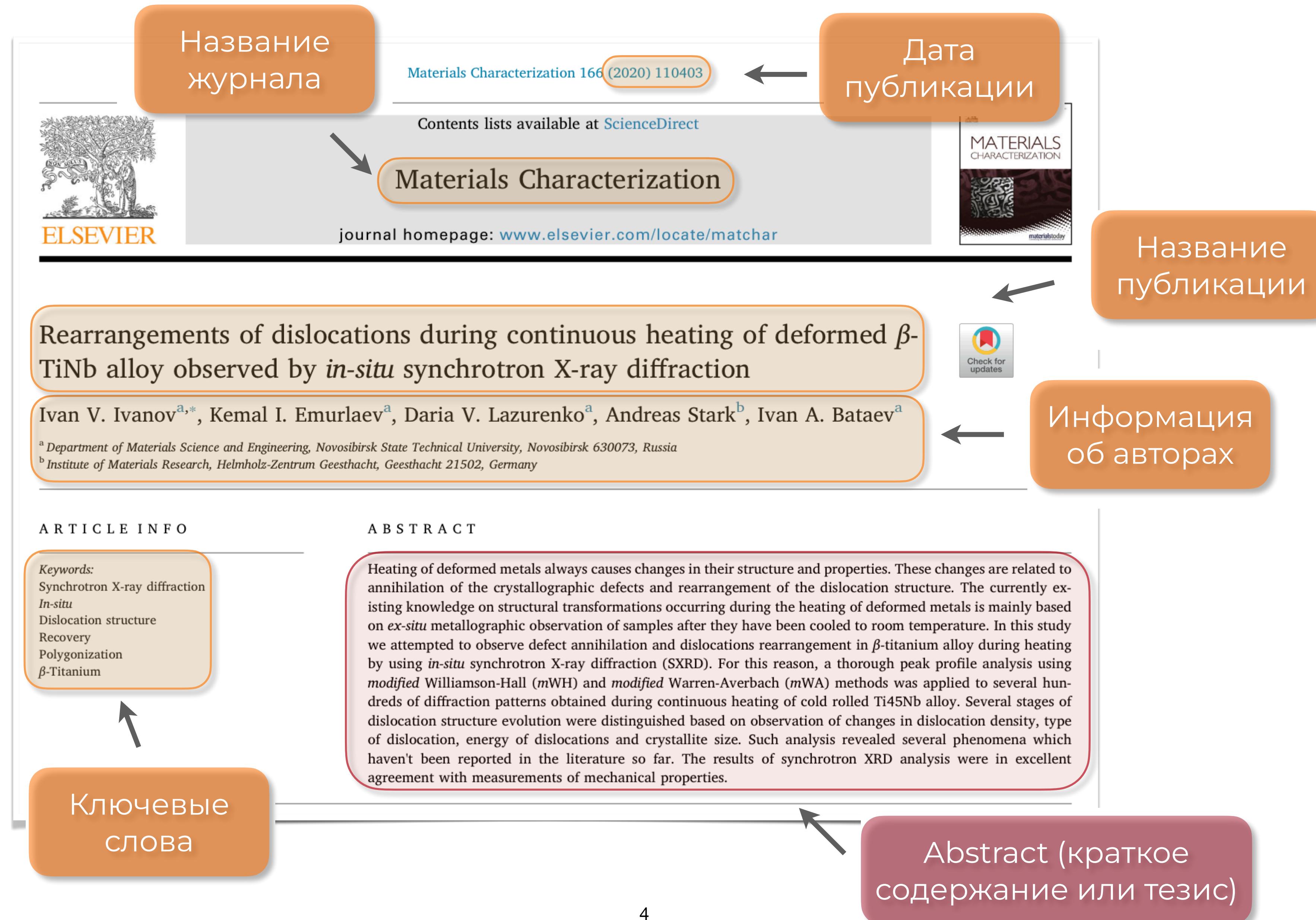
- **Импакт-фактор журнала (IF)** - степень цитируемости статей в журнале ( $IF = A/B$ , где А - число цитирований, В-число опубликованных статей)
- **Квартиль (Q)** - категория журналов, получаемая разделением всех журналов с импакт-фактором на 4 части (Q1, Q2, Q3 и Q4)

### Вывод:

```
if journal in Q1 and IF[journal] is IF[max(IF, key=IF.get)]:  
    should_publish = True
```

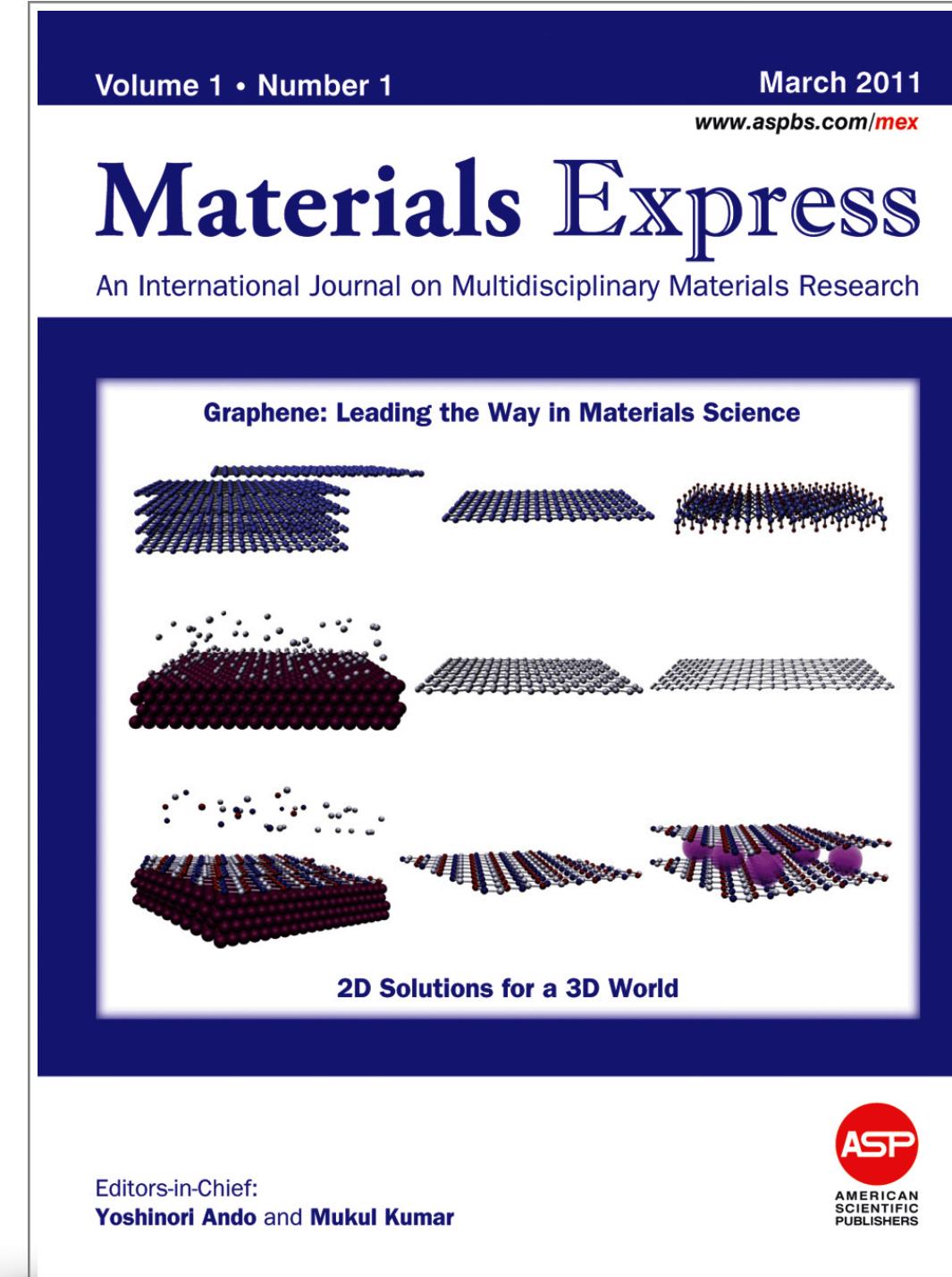
**Вопрос:** чем отличаются журналы одной тематики с разным IF?

# Какая информация о публикации общедоступна?





VS



IF: 46.863  
Q1

IF: None

Сбор тезисов журналов:  
Nature Materials - 1634  
Materials Express - 1136

Очистка и лемматизация

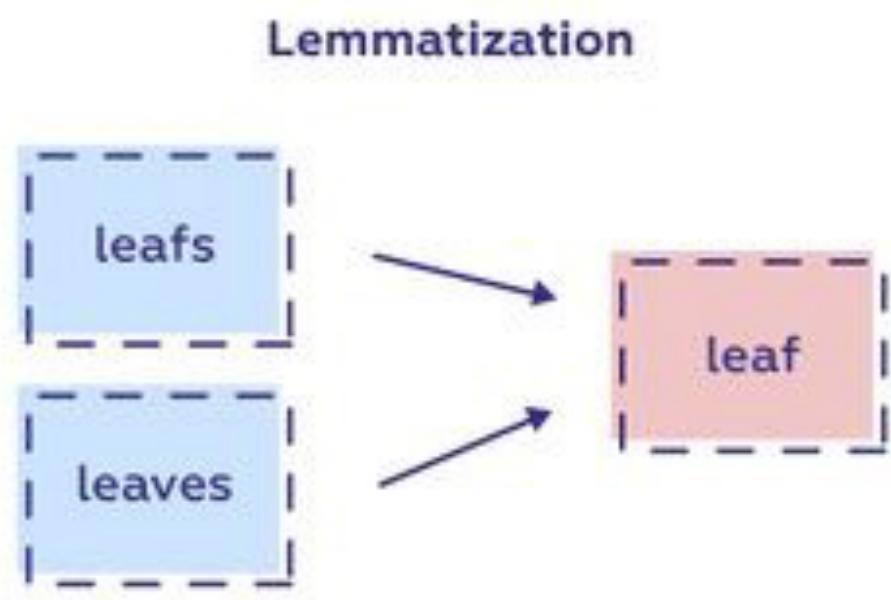
Преобразование TF-IDF

Gradient Boosting Classifier

The screenshot shows the homepage of the **nature materials** journal. At the top, there are links for "View all journals", "Search", "Login", "Explore content", "About the journal", "Publish with us", "Sign up for alerts", and "RSS feed". Below this, the "Research articles" section is displayed. Two articles are listed:

- Nanoparticle-modified microrobots for in vivo antibiotic delivery to treat acute bacterial pneumonia** (Article 22 Sept 2022) - A biohybrid microrobot consisting of nanoparticle-modified microalgae is constructed for active drug delivery in the lungs. In an acute bacterial pneumonia model, the microrobots effectively reduce bacterial burden and lessen animal mortality.
- Ultrastrong nanotwinned titanium alloys through additive manufacturing** (Article 15 Sept 2022) - Laser additive manufacturing can be exploited to generate unique internally twinned nanoprecipitates in commercial titanium alloys, paving the way to fabricate ultrastrong metallic materials with intricate shapes for broad applications.

On the right side of the page, there is information about the journal **Materials Express**, including its ISSN (2158-5849), a link to the publication homepage, and the publisher logo for American Scientific Publishers (ASP).



$$w_{x,y} = tf_{x,y} \times \log \left( \frac{N}{df_x} \right)$$

**TF-IDF**

Term  $x$  within document  $y$

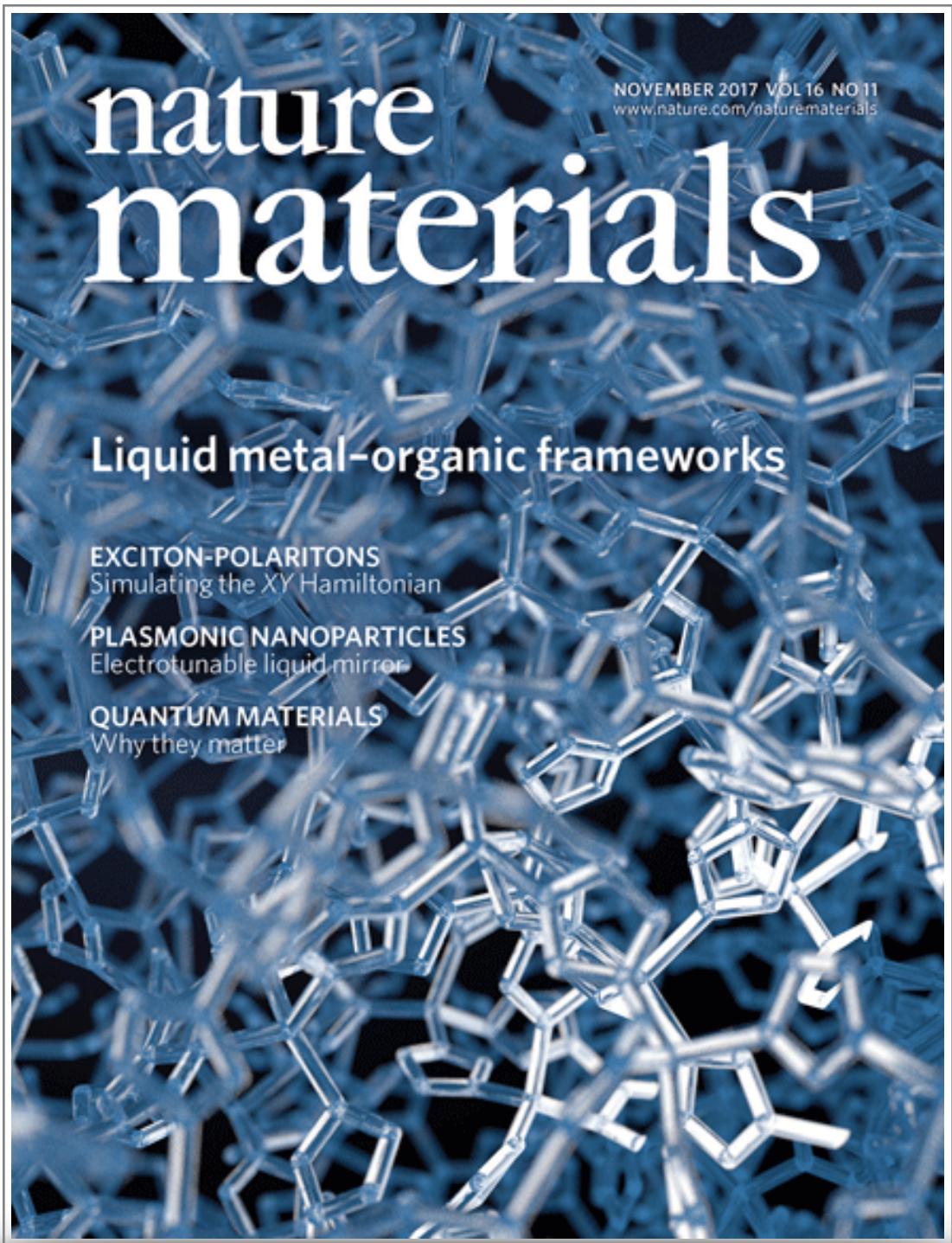
$tf_{x,y}$  = frequency of  $x$  in  $y$

$df_x$  = number of documents containing  $x$

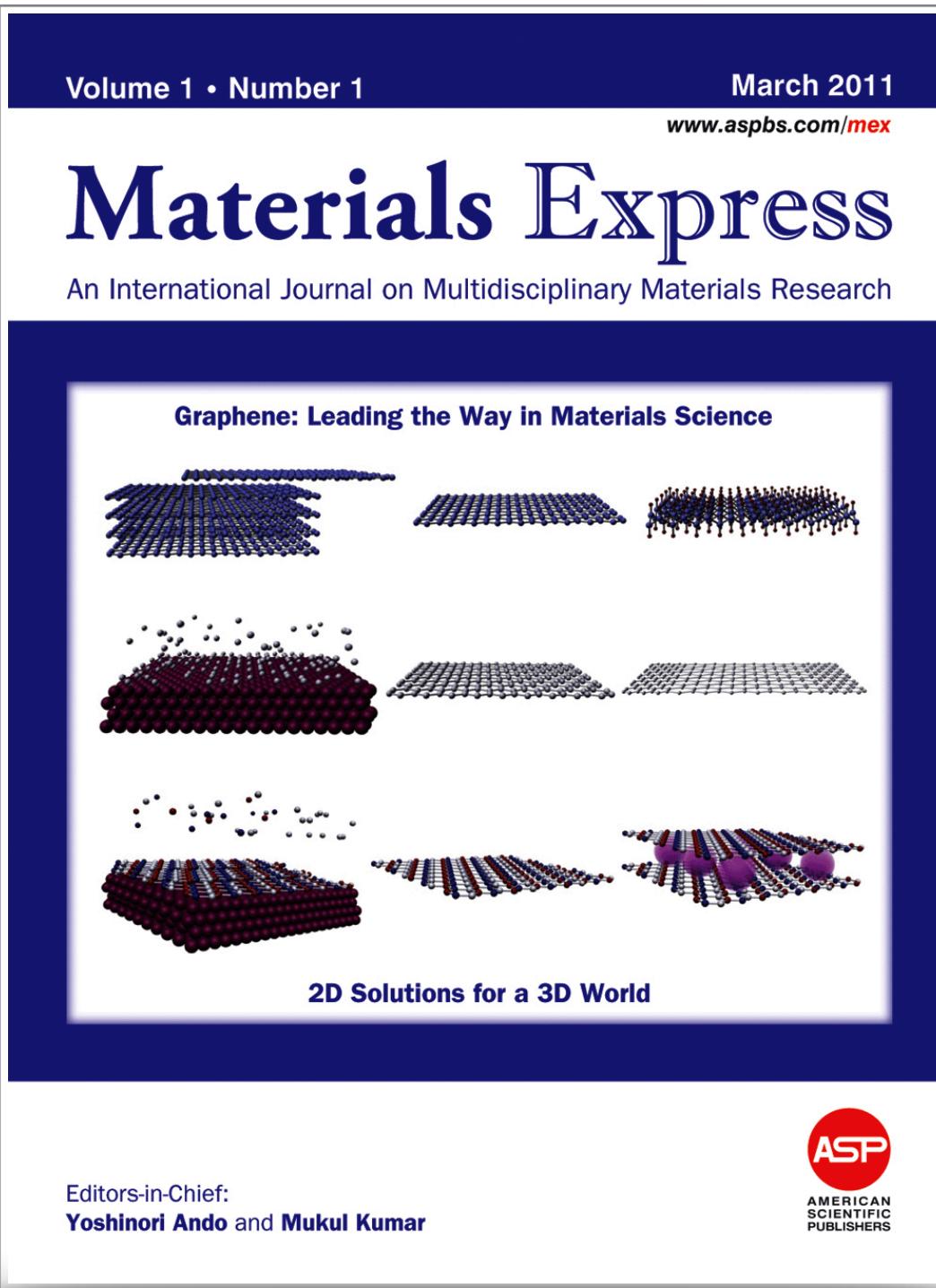
$N$  = total number of documents



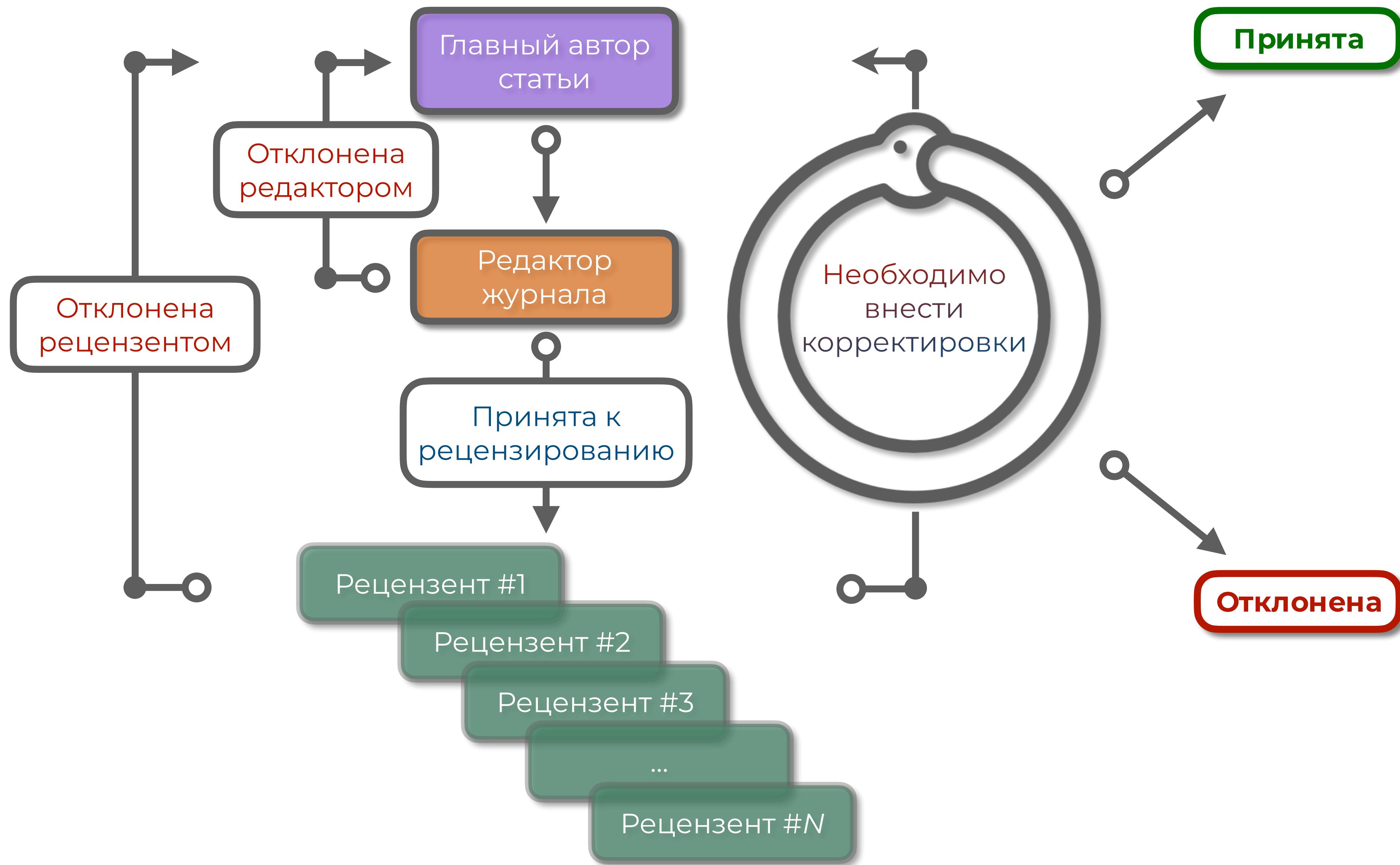
	precision	recall	f1-score	support		word	importance
<b>Materials Express</b>	0.96	0.92	0.94	336		<b>98</b>	material 43.0
<b>Nature Materials</b>	0.94	0.97	0.96	495		<b>145</b>	result 36.0
<b>accuracy</b>			0.95	831		<b>105</b>	method 25.0
<b>macro avg</b>	0.95	0.94	0.95	831		<b>132</b>	property 24.0
<b>weighted avg</b>	0.95	0.95	0.95	831		<b>79</b>	however 24.0
Confusion matrix							
True label		Predicted label					
Materials Express		Nature Materials					
Materials Express		301	35				
Nature Materials		17	478				



IF: 46.863 !!!  
Q1



IF: None



Search

New Search



Home • Books A - Z • Journals A - Z • Videos • Librarians

 **Include Preview-Only content****Refine Your Search****Content Type****Journal****Discipline****Materials Science****Subdiscipline**

see all

Characterization and Evaluation of Materials

56

Materials Science, general

40

Nanotechnology

27

Metallic Materials

25

Materials Engineering

20

**Language**

English

116

German

1

**117 Result(s) within Materials Science** **Journal** **Sort By****Newest First**

Oldest First

**Date Published**

Page

1

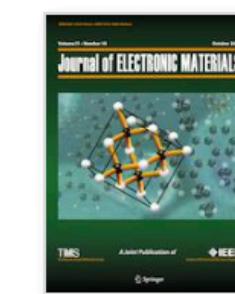
of 6

**Journal****Rare Metals**

Volume 28 / 2009 - Volume 41 / 2022

**Journal****Journal of Electronic Materials**

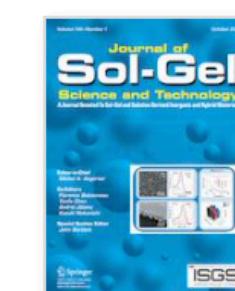
Volume 1 / 1972 - Volume 51 / 2022

**Journal****Acta Metallurgica Sinica (English Letters)**

Volume 26 / 2013 - Volume 35 / 2022

**Journal****Journal of Sol-Gel Science and Technology**

Volume 1 / 1994 - Volume 104 / 2022

**Journal****International Journal of Minerals, Metallurgy and Materials**

**62 журнала с IF  
(публикации от 1972 года)**

journal	1462
Acta Metallurgica Sinica (English Letters)	372
Advanced Composites and Hybrid Materials	106
Advanced Fiber Materials	1100
Applied Composite Materials	1700
Applied Nanoscience	3335
Bulletin of Materials Science	312
Carbon Letters	1290
Electronic Materials Letters	936
Experimental Techniques	739
Frontiers of Materials Science	2033
Glass Physics and Chemistry	2273
Glass and Ceramics	483
Gold Bulletin	212
Integrating Materials and Manufacturing Innovation	797
International Journal of Metalcasting	2062
International Journal of Minerals, Metallurgy and Materials	561
Journal of Advanced Ceramics	1671
Journal of Coatings Technology and Research	1498
Journal of Electroceramics	8248
Journal of Electronic Materials	7136
Journal of Materials Engineering and Performance	7785
Journal of Materials Research	20932
Journal of Materials Science	11001
Journal of Materials Science: Materials in Electronics	4801
Journal of Materials Science: Materials in Medicine	5947
Journal of Nanoparticle Research	158
Journal of Rubber Research	4898
Journal of Sol-Gel Science and Technology	3142
Journal of Surface Investigation: X-ray, Synchrotron and Neutron Techniques	2385
Journal of Thermal Spray Technology	3793
Journal of Wuhan University of Technology-Mater. Sci. Ed.	648
Journal of the Australian Ceramic Society	202
Journal of the Indian Institute of Science	179
Journal of the Korean Ceramic Society	352
Korea-Australia Rheology Journal	1930
MRS Bulletin	869
MRS Communications	2238
Materials Science	1395
Mechanics of Composite Materials	2281
Metal Science and Heat Treatment	9206
Metallurgical and Materials Transactions A	3765
Metallurgical and Materials Transactions B	2492
Metallurgist	3147
Metals and Materials International	3889
Nano Research	1394
Oxidation of Metals	972
Physics of Metals and Metallography	1959
Powder Metallurgy and Metal Ceramics	164
Progress in Biomaterials	2795
Protection of Metals and Physical Chemistry of Surfaces	2275
Rare Metals	2224
Refractories and Industrial Ceramics	1657
Rheologica Acta	1484
Russian Journal of Non-Ferrous Metals	2327
Russian Journal of Nondestructive Testing	1297
Science China Materials	1
Soviet Powder Metallurgy and Metal Ceramics	1893
Strength of Materials	1727
The Physics of Metals and Metallography	2612
Transactions of the Indian Institute of Metals	2982
Tribology Letters	1735
Welding in the World	

**13 журналов  
публикации от 2000 до 2021 года  
число публикаций от 2750 до 3400**



**Bulletin of Material Science**

**Journal of Electronic Materials**

**Journal of Materials Engineering  
and Performance**

**Journal of Materials Science:  
Materials in Medicine**

**Journal of Nanoparticle  
Research**

**Journal of Sol-Gel  
Technology**

**Journal of Surface Investigation**

**Journal of Wuhan University**

**Metallurgical and  
Materials Transactions A**

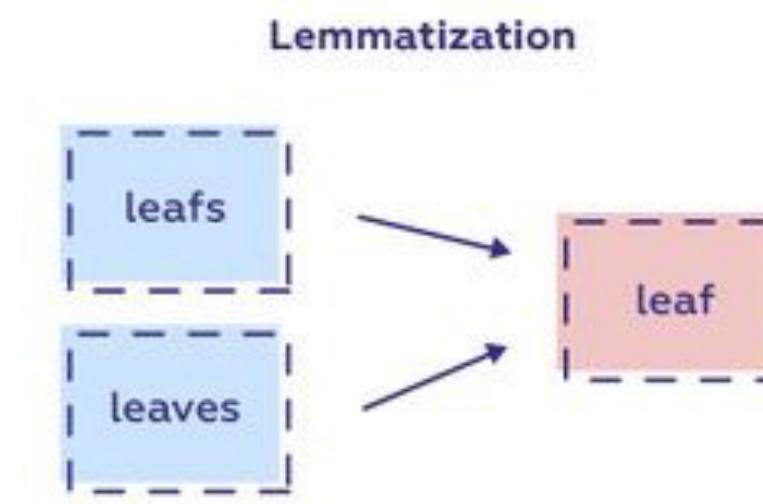
**Metallurgical and  
Materials Transactions B**

**Nano Research**

**Protection of Metals**

**Tribology Letters**

Очистка и лемматизация



Преобразование TF-IDF

$$w_{x,y} = \text{tf}_{x,y} \times \log \left( \frac{N}{df_x} \right)$$

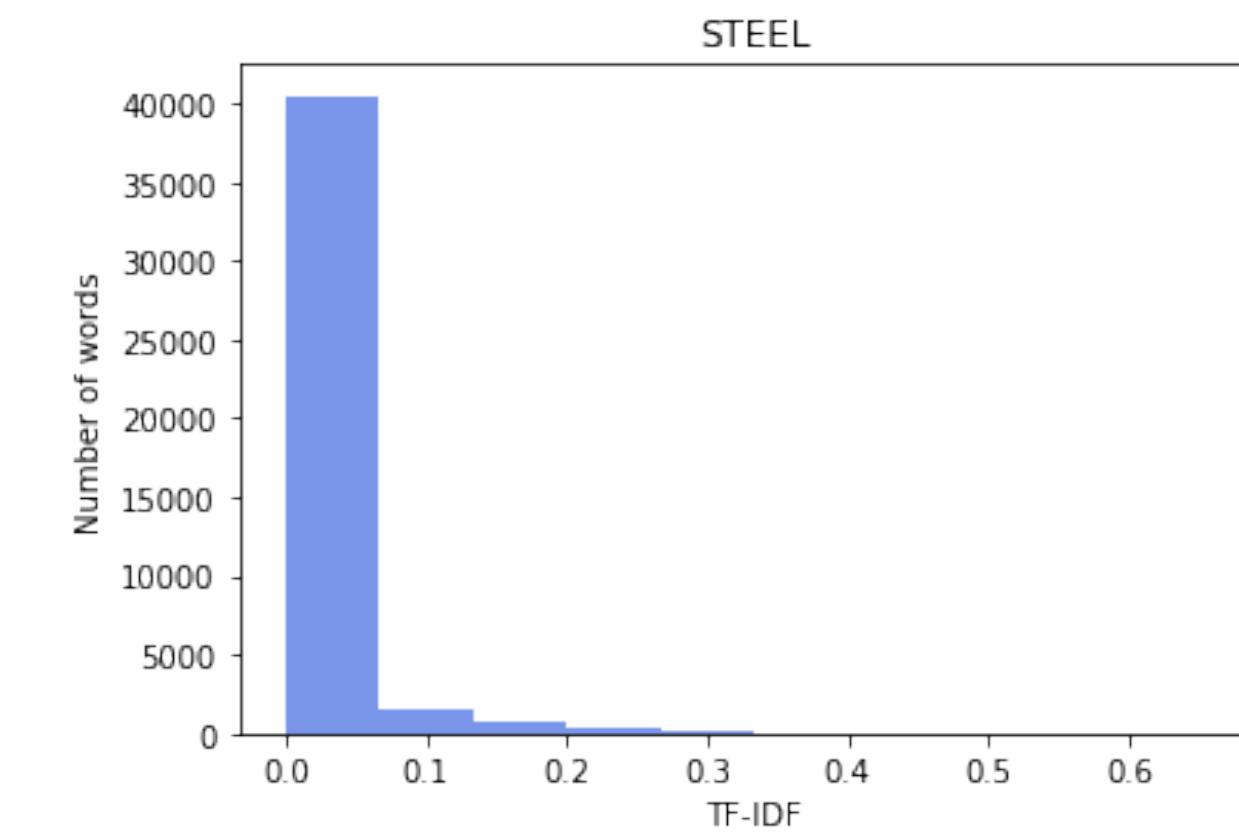
TF-IDF

Term  $x$  within document  $y$

$\text{tf}_{x,y}$  = frequency of  $x$  in  $y$

$df_x$  = number of documents containing  $x$

$N$  = total number of documents



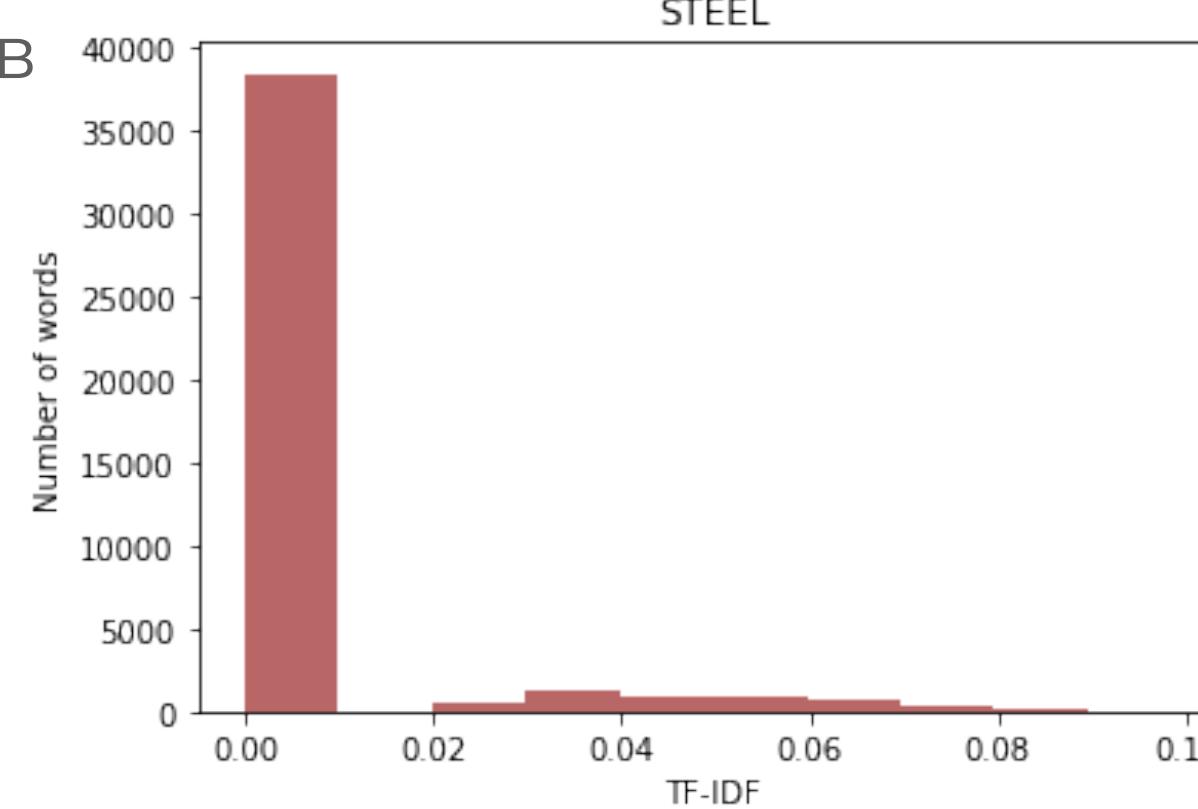
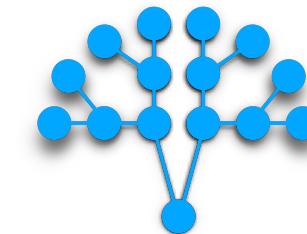
Создание и преобразование признаков

+ число слов  
+ преобразование inverse hyperbolic sine (IHS)

} 445 признаков

Gradient Boosting Classifier  
(Cross Validation +  
Randomized Search)

 LightGBM



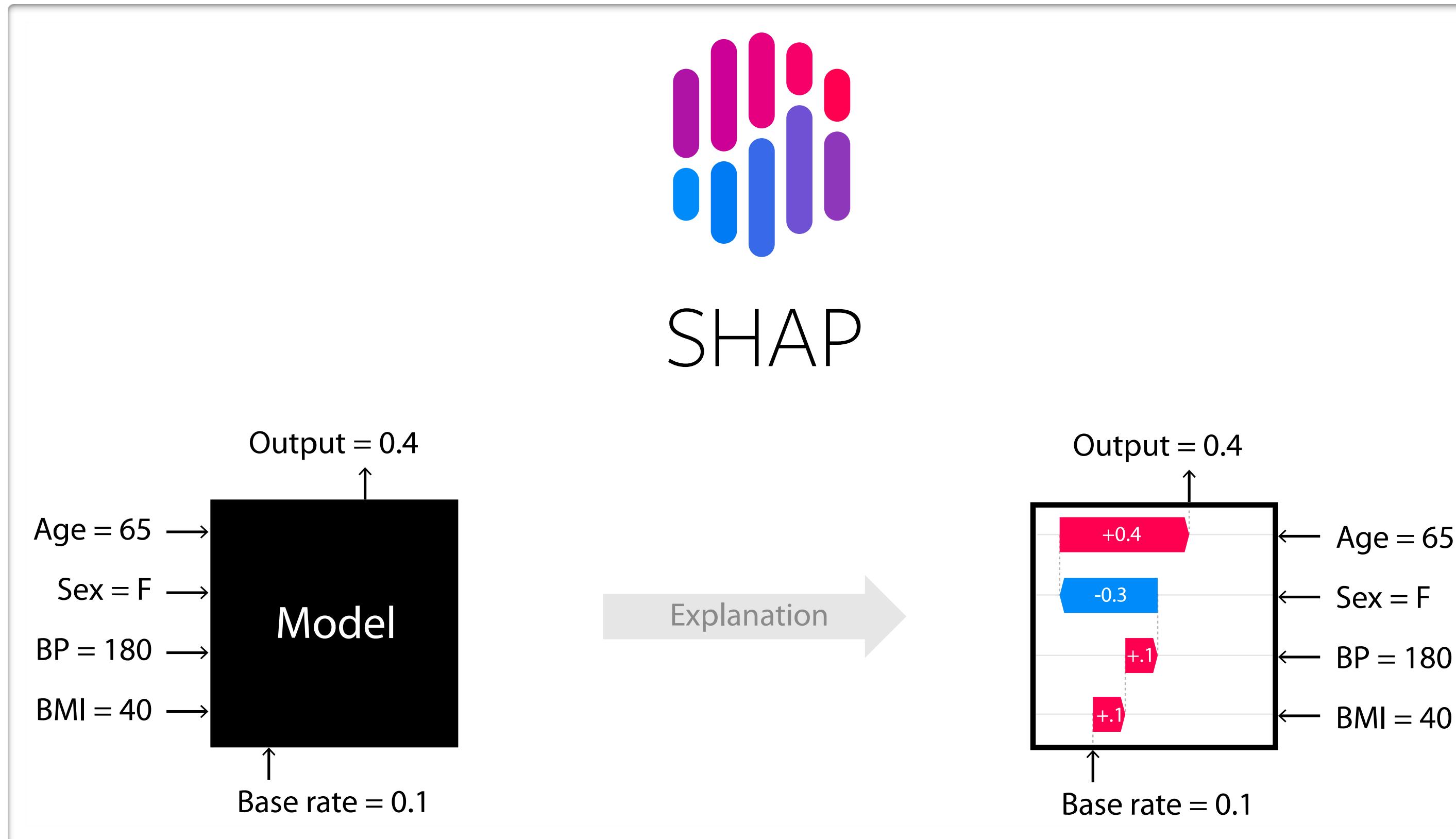
преобразование  
IHS

# Результаты классификации тестовой выборки

		precision	recall	f1-score	support
	<b>Bulletin of Materials Science</b>	0.45	<b>0.44</b>	0.44	815
	<b>Journal of Electronic Materials</b>	0.55	<b>0.57</b>	0.56	843
	<b>Journal of Materials Engineering and Performance</b>	0.47	<b>0.47</b>	0.47	842
	<b>Journal of Materials Science: Materials in Medicine</b>	0.74	<b>0.72</b>	0.73	860
	<b>Journal of Nanoparticle Research</b>	0.54	<b>0.58</b>	0.56	848
	<b>Journal of Sol-Gel Science and Technology</b>	0.70	<b>0.68</b>	0.69	871
	<b>Journal of Surface Investigation: X-ray, Synchrotron and..</b>	0.72	<b>0.76</b>	0.74	810
	<b>Journal of Wuhan University of Technology-Mater. Sci. Ed.</b>	0.60	<b>0.54</b>	0.57	888
	<b>Metallurgical and Materials Transactions A</b>	0.55	<b>0.57</b>	0.56	848
	<b>Metallurgical and Materials Transactions B</b>	0.68	<b>0.69</b>	0.69	838
	<b>Nano Research</b>	0.70	<b>0.72</b>	0.71	882
	<b>Protection of Metals and Physical Chemistry of Surfaces</b>	0.74	<b>0.68</b>	0.71	738
	<b>Tribology Letters</b>	0.79	<b>0.81</b>	0.80	714

	accuracy	0.63	10797
	macro avg	0.63	<b>0.63</b>
	weighted avg	0.63	0.63

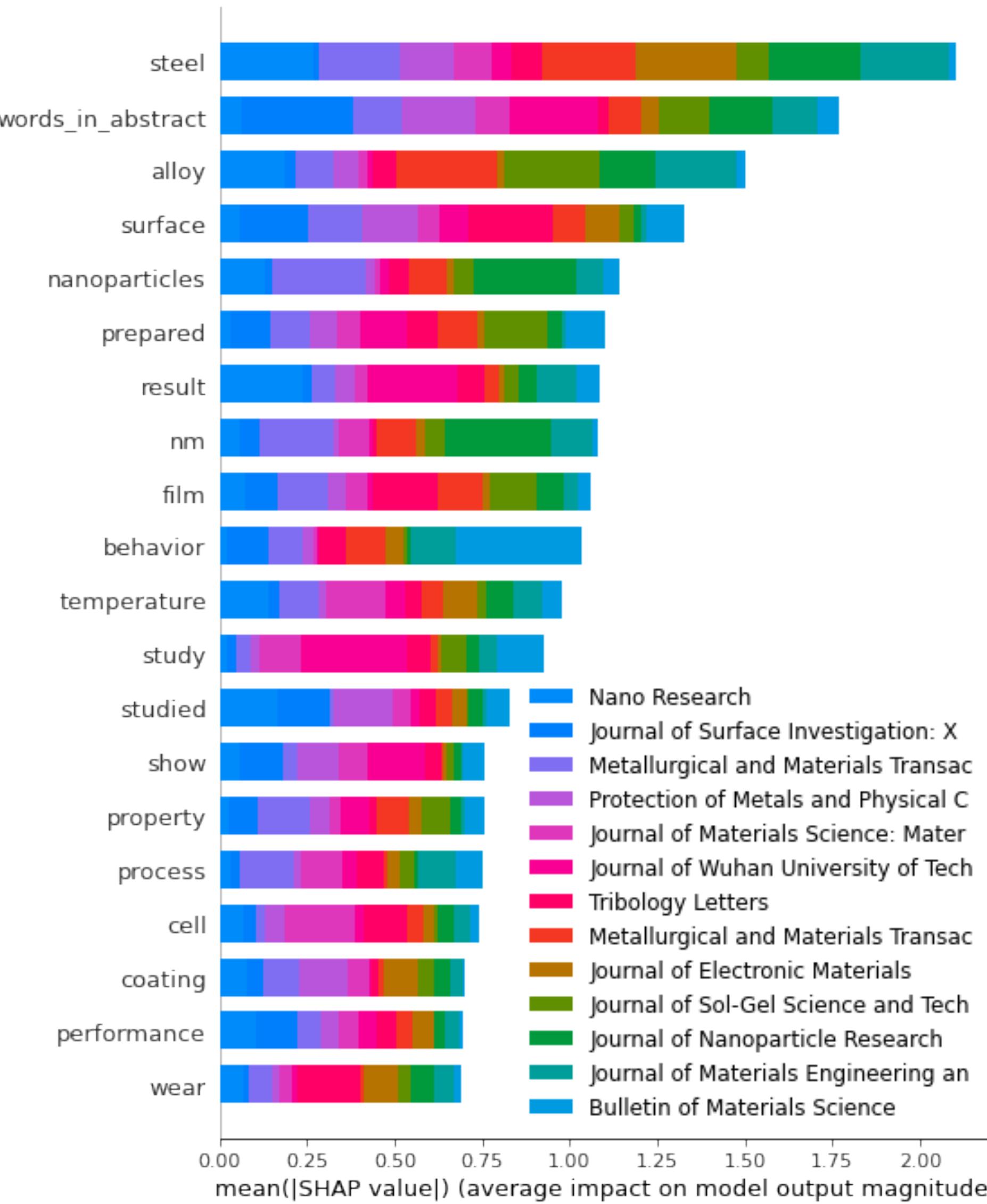
# SHAP (SHapley Additive exPlanations)

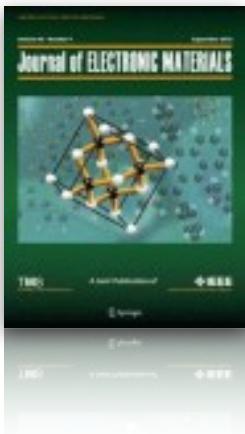


<https://github.com/slundberg/shap>

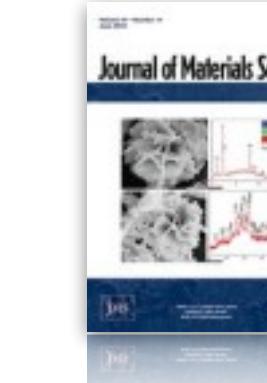
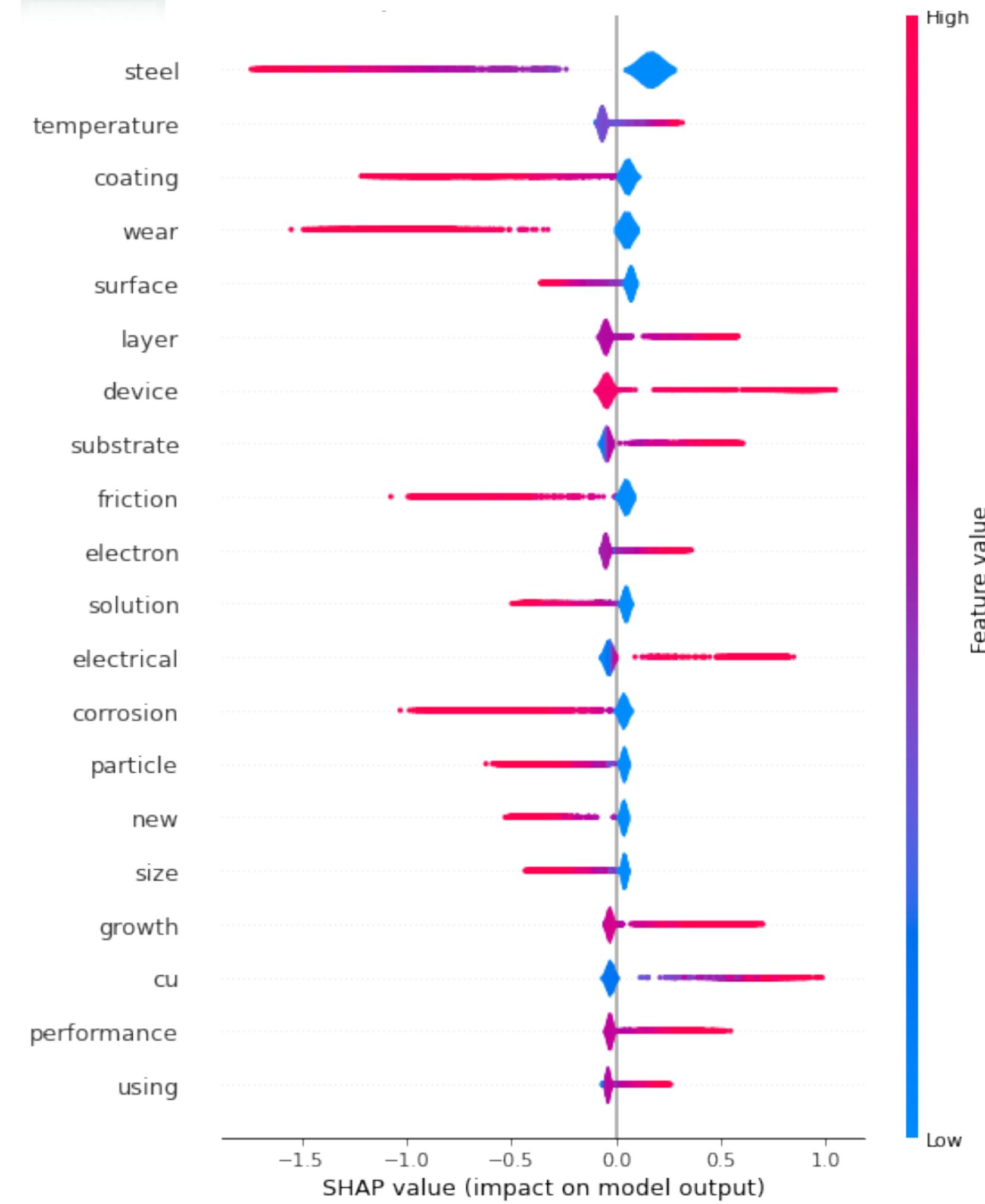
slundberg / shap Public

# Средние значения SHAP для каждого признака

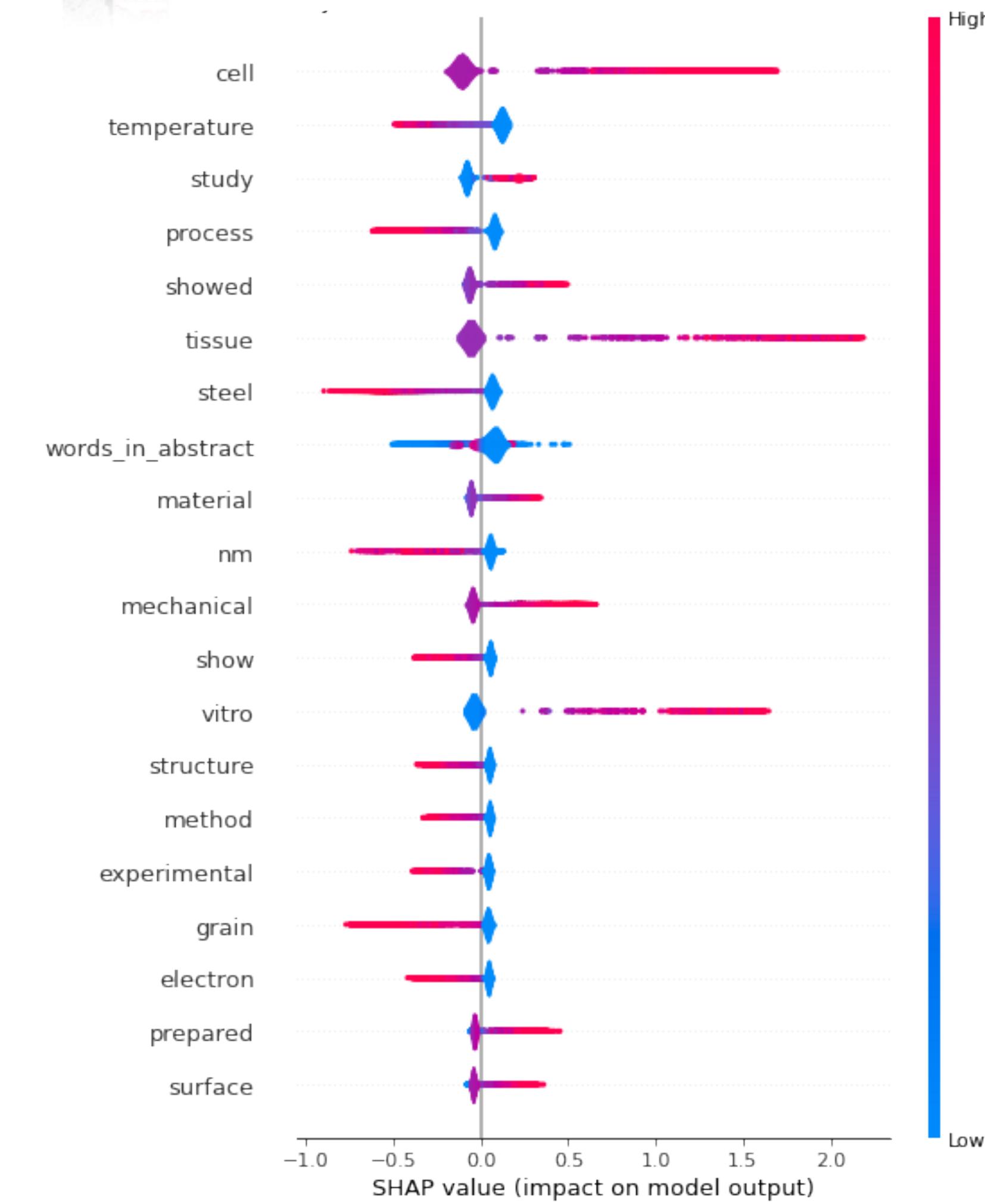


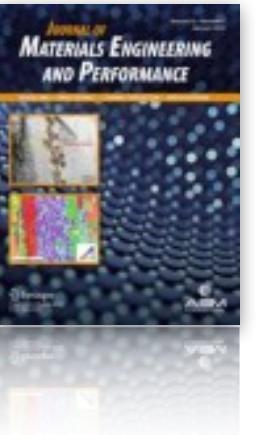


## Journal of Electronic Materials

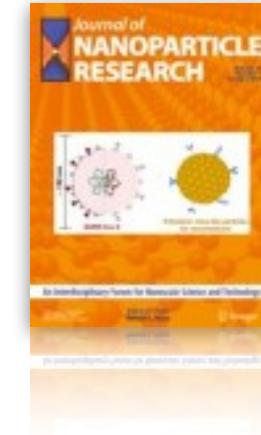
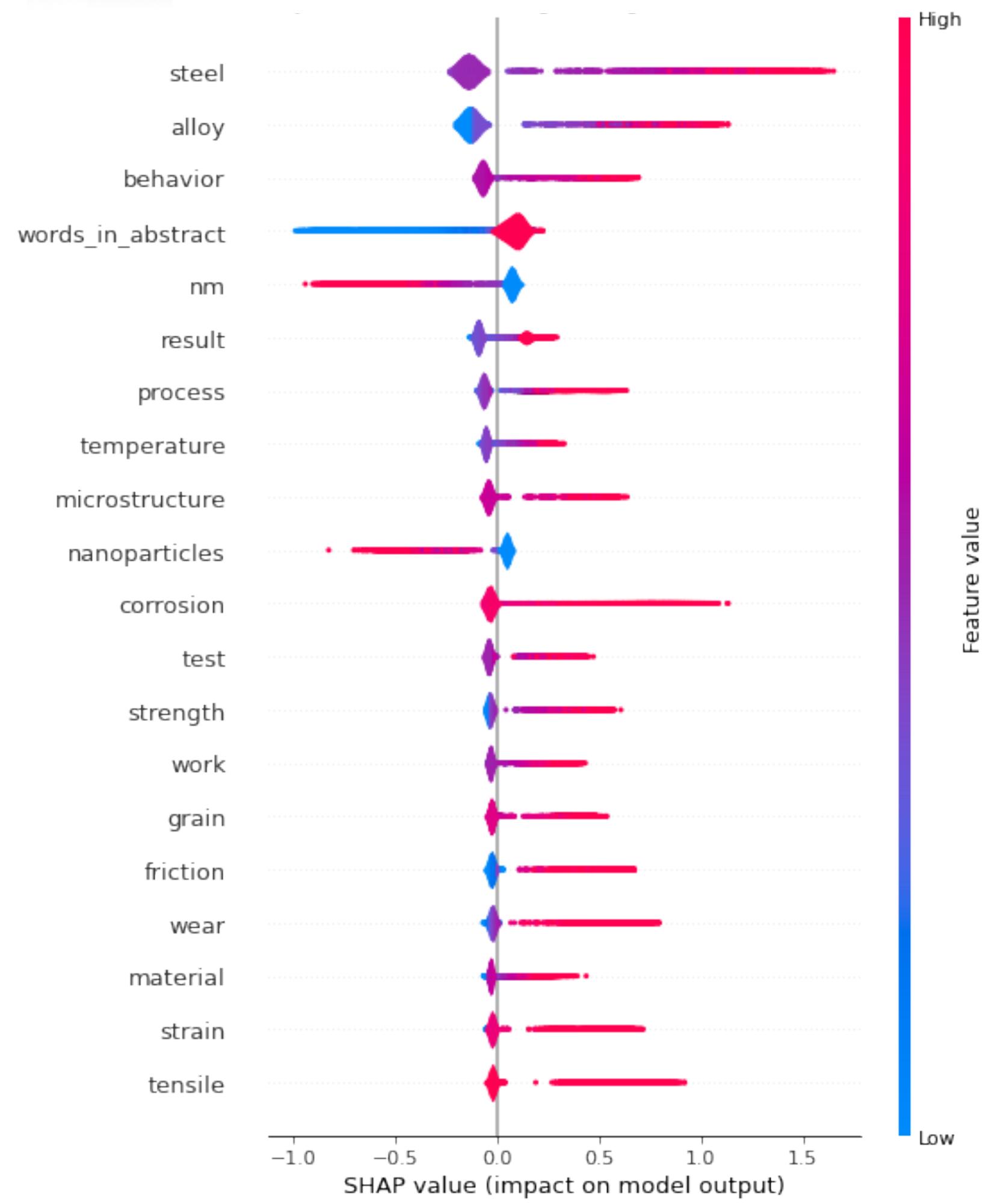


## Journal of Materials Science: Materials in Medicine

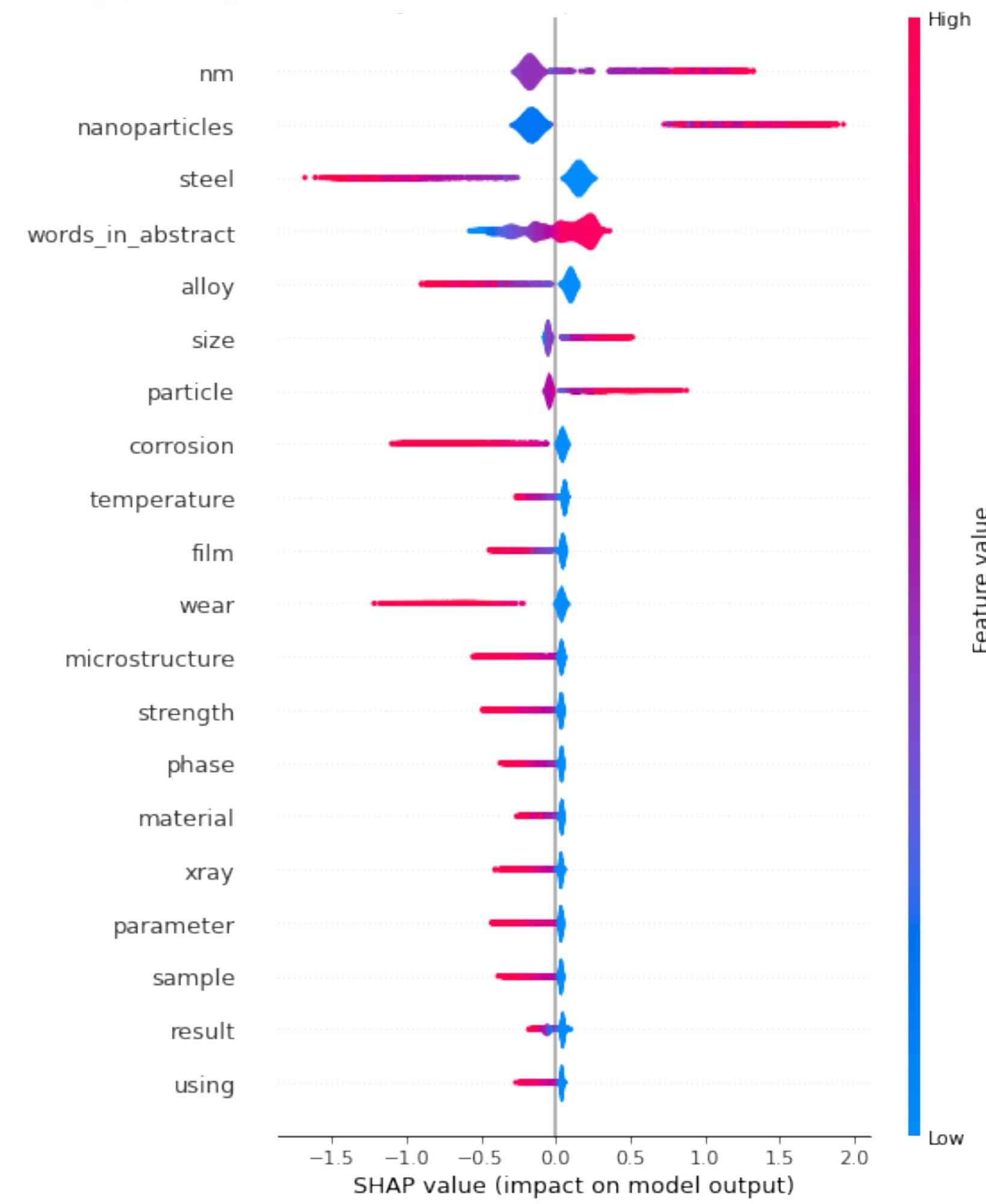




## Journal of Materials Engineering and Performance

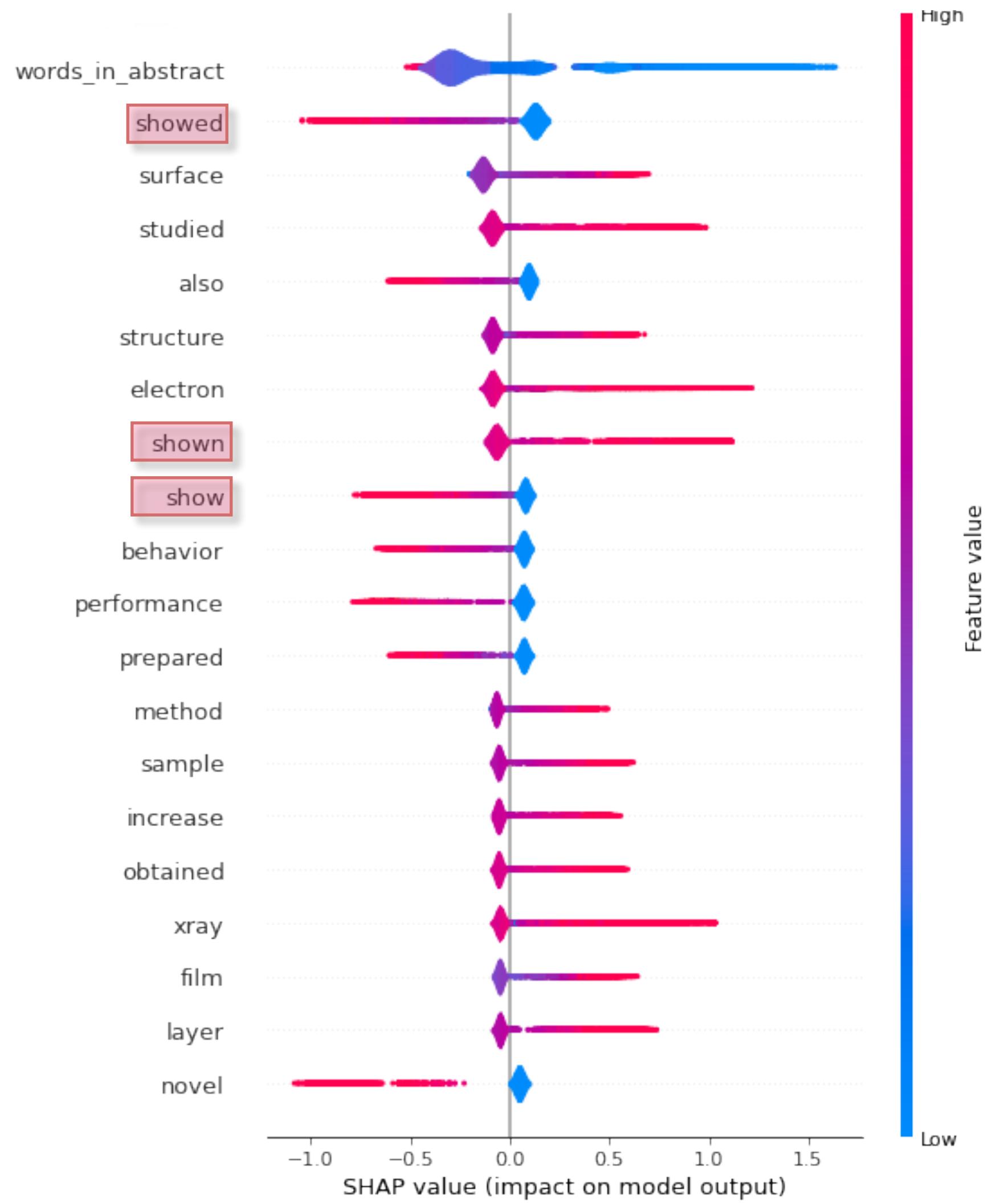


## Journal of Nanoparticle Research

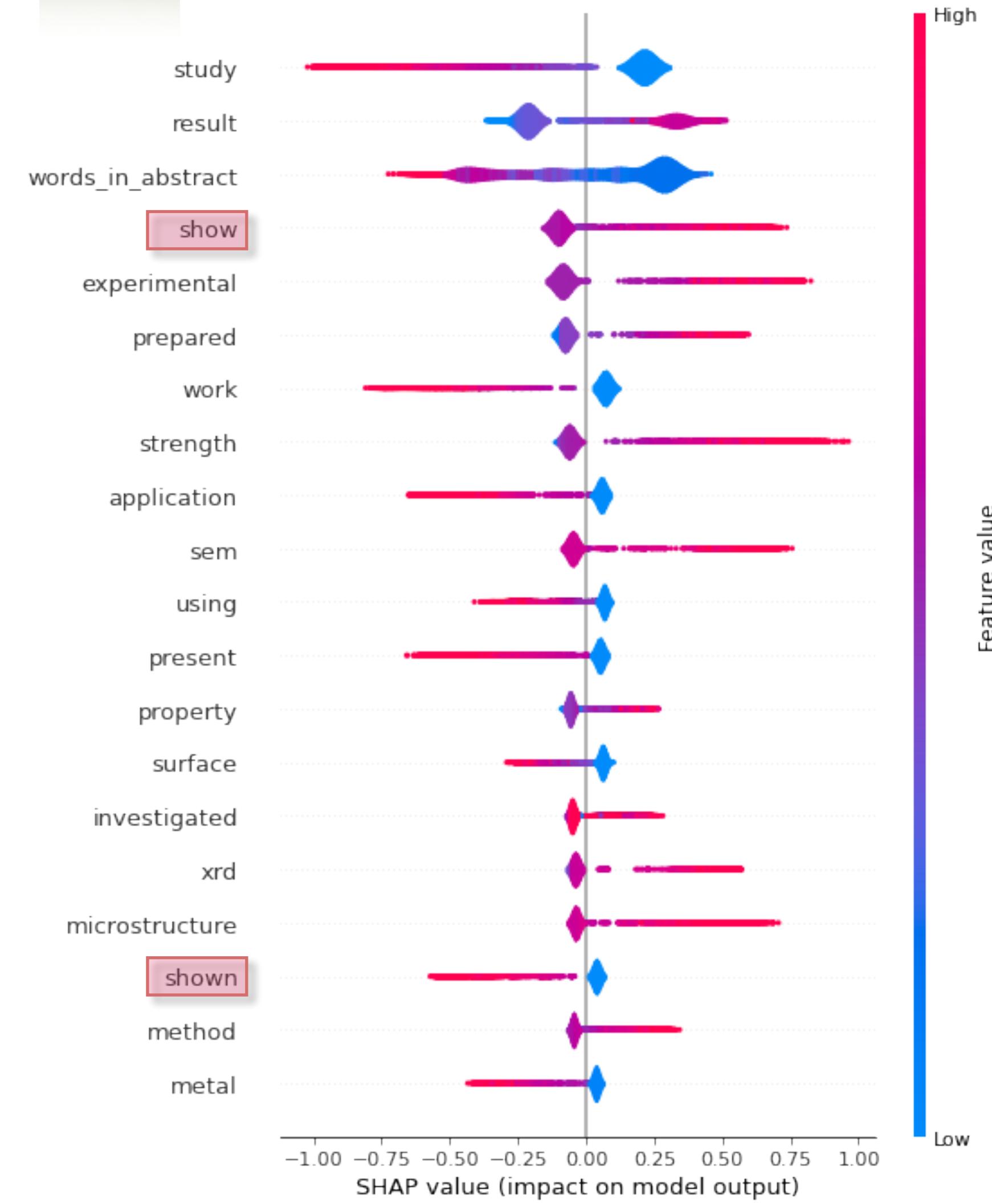




## Journal of Surface Investigation



## Journal of Wuhan University



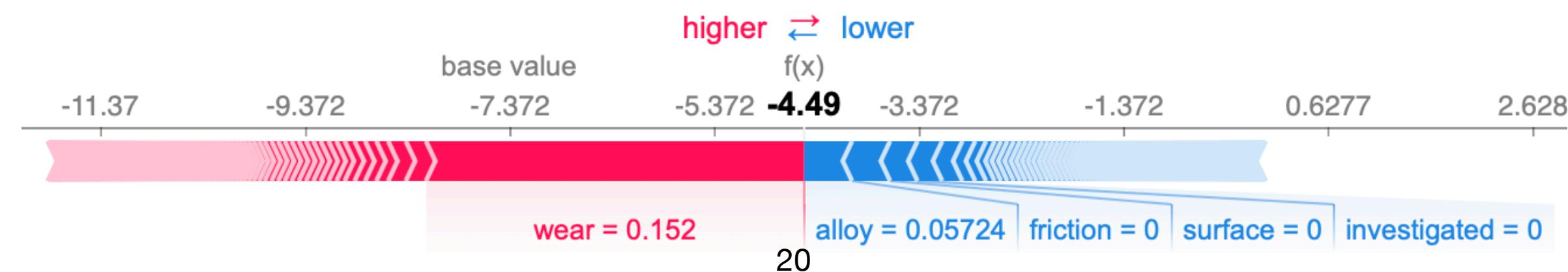
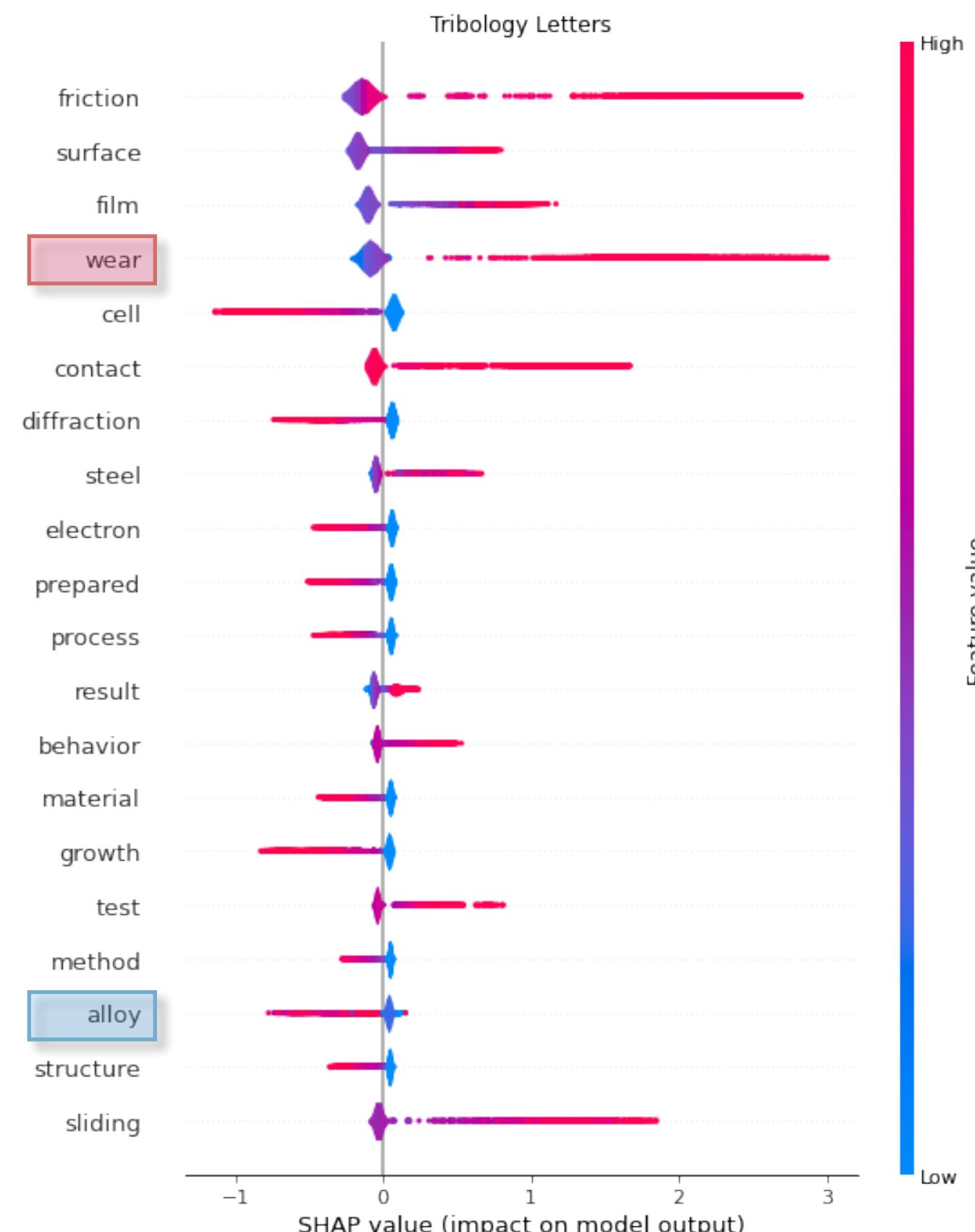
# Случай из жизни..

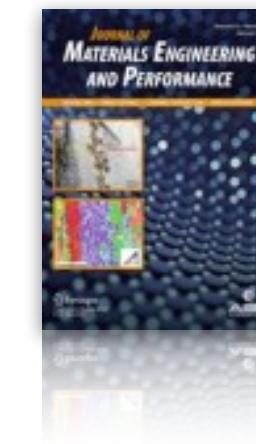
The Fe<sub>66</sub>Cr<sub>10</sub>Nb<sub>5</sub>B<sub>19</sub> alloy **coatings** with high hardness (~850 HV<sub>300</sub>), low porosity (less 3%), low content of crystalline phase (less 2.5 wt.%), elevated nanohardness (average value 13.7 GPa), and high wear resistance were obtained in a wide range of detonation spraying modes. The results under dry linearly reciprocating sliding **wear** tests of **coatings** and stainless steel carried out according to ASTM G 133-05 are presented. The volume loss of detonation **coatings** obtained at an explosive charge of 50–70%, measured on an optical profilometer, is significantly lower than that of stainless steel. The similar values of volume scratches of Fe<sub>66</sub>Cr<sub>10</sub>Nb<sub>5</sub>B<sub>19</sub> **coatings** obtained at an explosive charge of 40–70% can be attributed to similar values of porosity and content of crystalline phase. The scratch and spalling mechanisms are the main mechanisms of material removal from the **coatings**.

	probability, %	journal	impact factor
1	52.63	Journal of Materials Engineering and Performance	2.036
2	34.76	Metallurgical and Materials Transactions A	2.726
3	7.40	Tribology Letters	3.327
4	3.14	Bulletin of Materials Science	1.878
5	0.71	Journal of Nanoparticle	2.533
6	0.68	Journal of Wuhan University of Technology-Mate...	1.271
7	0.35	Journal of Materials Science: Materials in Med...	4.727
8	0.16	Journal of Sol-Gel Science and Technology	2.606
9	0.10	Journal of Electronic Materials	2.047
10	0.03	Metallurgical and Materials Transactions B	2.872
11	0.03	Protection of Metals and Physical Chemistry of...	0.943
12	0.01	Nano Research	10.269
13	0.01	Journal of Surface Investigation: X-ray, Synch...	0.359

# Почему не Tribology Letters?

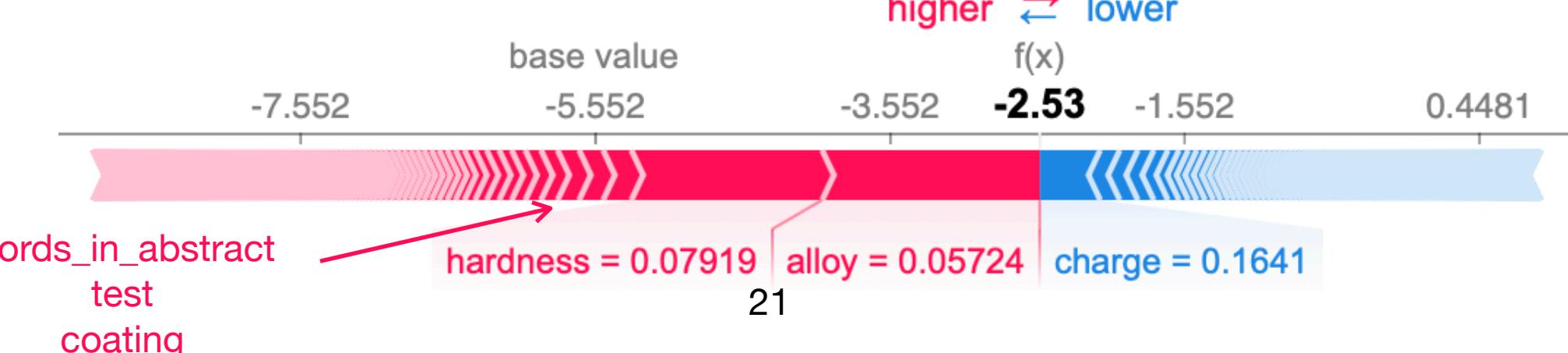
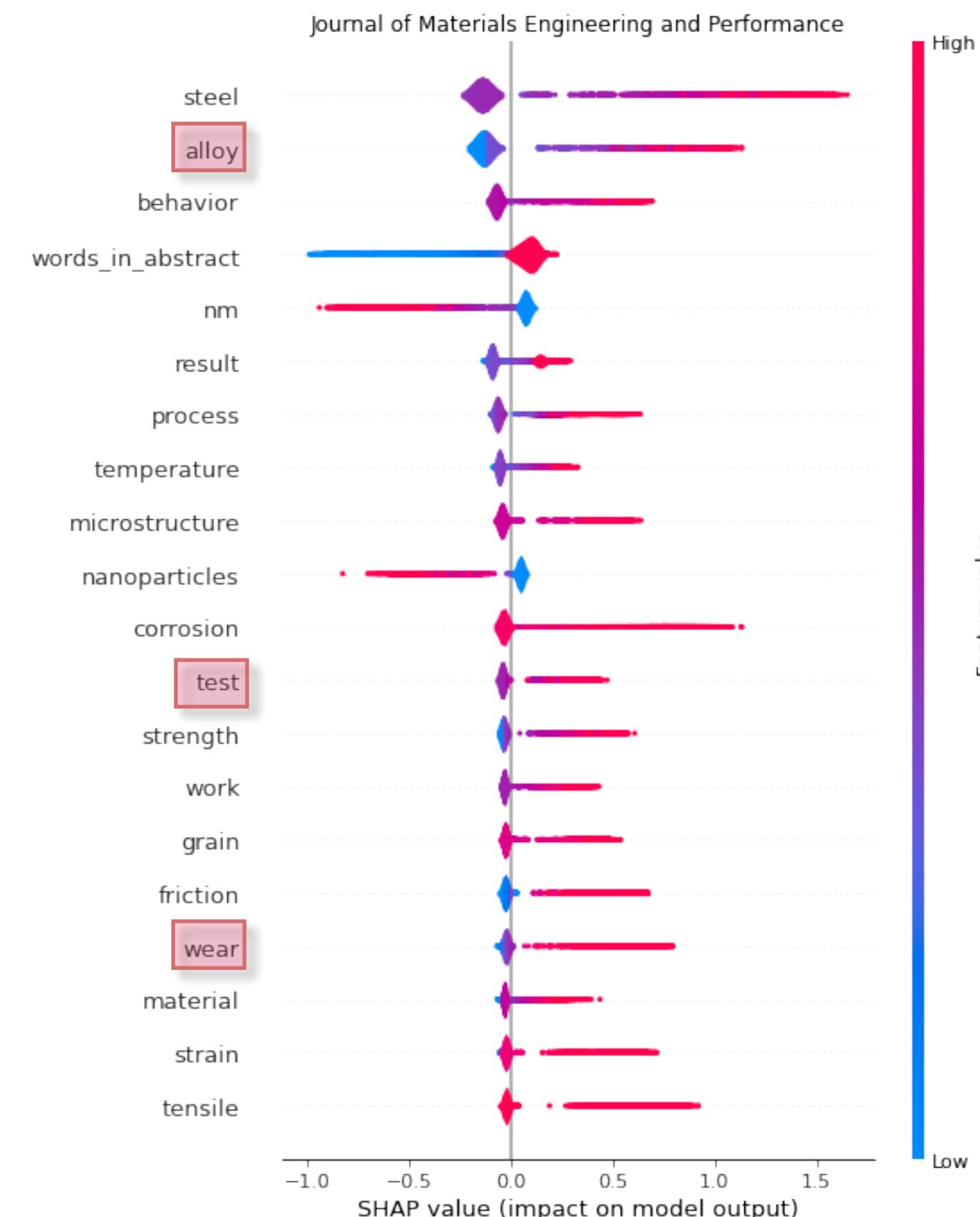
The Fe<sub>66</sub>Cr<sub>10</sub>Nb<sub>5</sub>B<sub>19</sub> alloy coatings with high hardness (~850 HV<sub>300</sub>), low porosity (less 3%), low content of crystalline phase (less 2.5 wt.%), elevated nanohardness (average value 13.7 GPa), and high wear resistance were obtained in a wide range of detonation spraying modes. The results under dry linearly reciprocating sliding wear tests of coatings and stainless steel carried out according to ASTM G 133-05 are presented. The volume loss of detonation coatings obtained at an explosive charge of 50–70%, measured on an optical profilometer, is significantly lower than that of stainless steel. The similar values of volume scratches of Fe<sub>66</sub>Cr<sub>10</sub>Nb<sub>5</sub>B<sub>19</sub> coatings obtained at an explosive charge of 40–70% can be attributed to similar values of porosity and content of crystalline phase. The scratch and spalling mechanisms are the main mechanisms of material removal from the coatings.



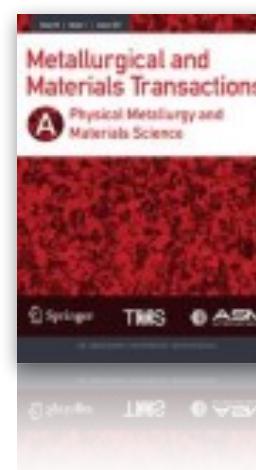


# Тогда почему Journal of Materials Engineering and Performance?

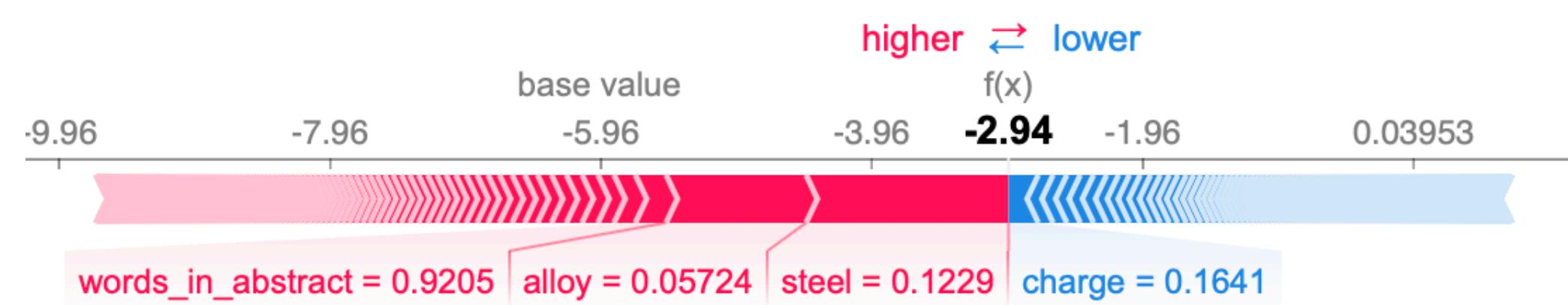
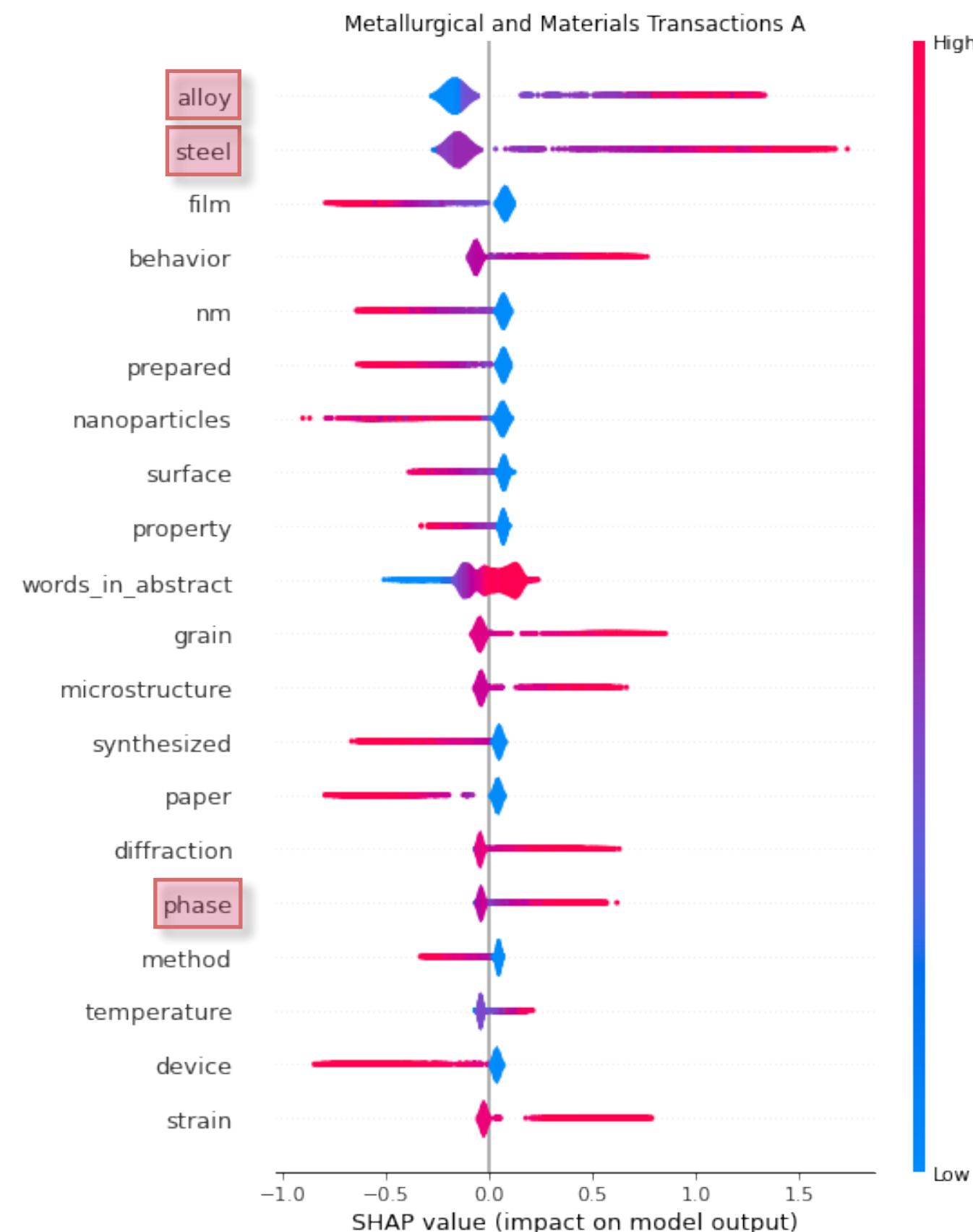
The Fe<sub>66</sub>Cr<sub>10</sub>Nb<sub>5</sub>B<sub>19</sub> alloy coatings with high hardness (~850 HV<sub>300</sub>), low porosity (less 3%), low content of crystalline phase (less 2.5 wt.%), elevated nanohardness (average value 13.7 GPa), and high wear resistance were obtained in a wide range of detonation spraying modes. The results under dry linearly reciprocating sliding wear tests of coatings and stainless steel carried out according to ASTM G 133-05 are presented. The volume loss of detonation coatings obtained at an explosive charge of 50–70%, measured on an optical profilometer, is significantly lower than that of stainless steel. The similar values of volume scratches of Fe<sub>66</sub>Cr<sub>10</sub>Nb<sub>5</sub>B<sub>19</sub> coatings obtained at an explosive charge of 40–70% can be attributed to similar values of porosity and content of crystalline phase. The scratch and spalling mechanisms are the main mechanisms of material removal from the coatings.



# А почему Metallurgical and Materials Transactions A?



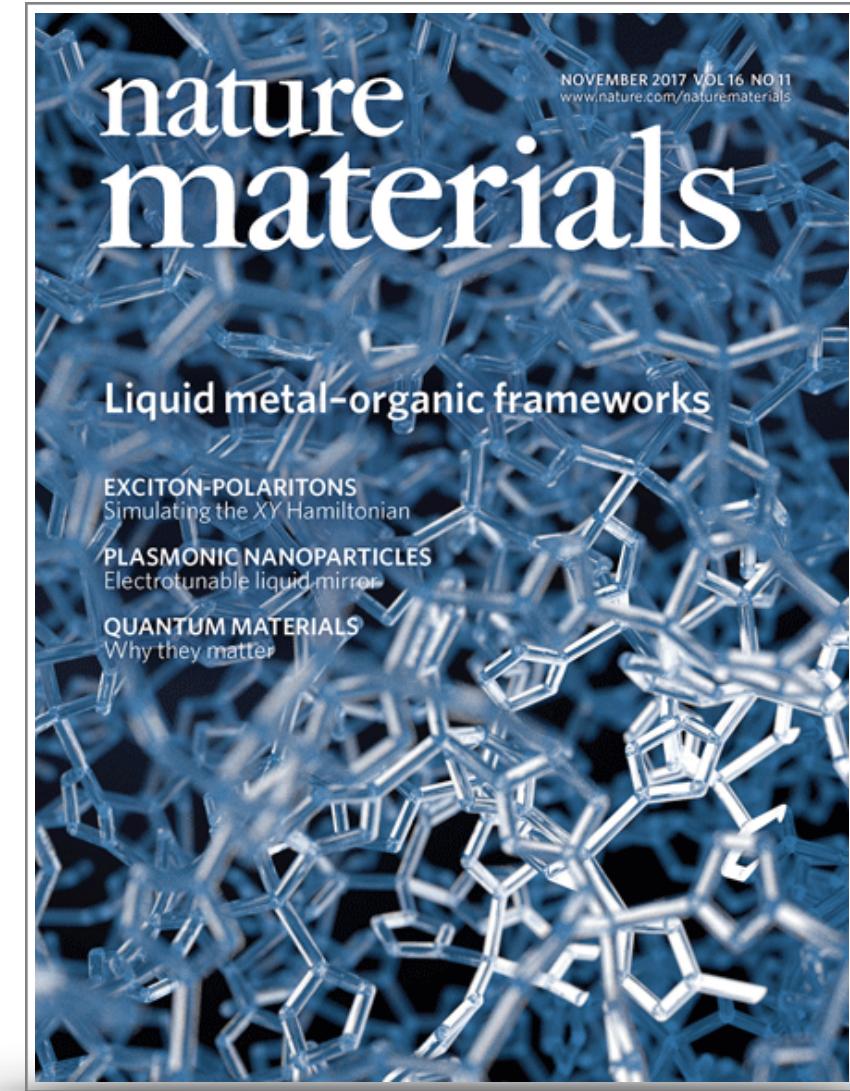
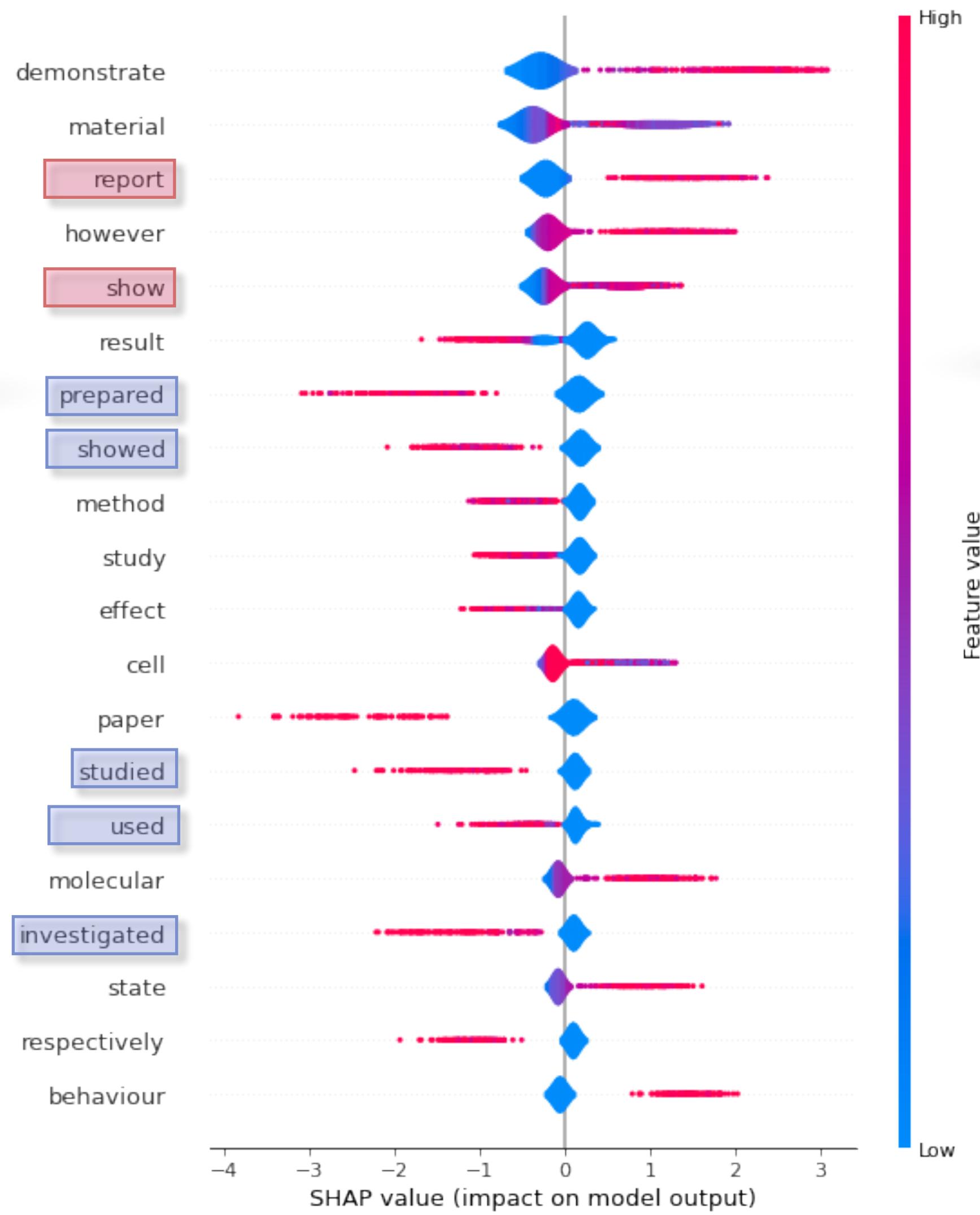
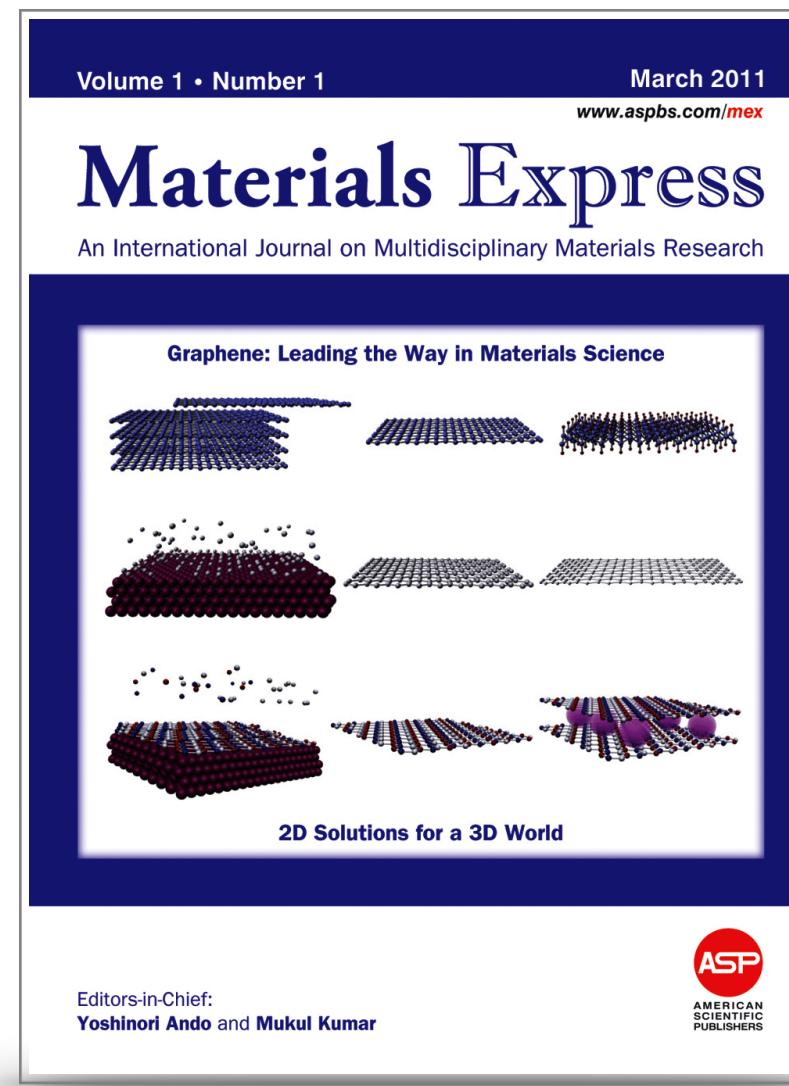
The Fe<sub>66</sub>Cr<sub>10</sub>Nb<sub>5</sub>B<sub>19</sub> alloy coatings with high hardness (~850 HV<sub>300</sub>), low porosity (less 3%), low content of crystalline phase (less 2.5 wt.%), elevated nanohardness (average value 13.7 GPa), and high wear resistance were obtained in a wide range of detonation spraying modes. The results under dry linearly reciprocating sliding wear tests of coatings and stainless steel carried out according to ASTM G 133-05 are presented. The volume loss of detonation coatings obtained at an explosive charge of 50–70%, measured on an optical profilometer, is significantly lower than that of stainless steel. The similar values of volume scratches of Fe<sub>66</sub>Cr<sub>10</sub>Nb<sub>5</sub>B<sub>19</sub> coatings obtained at an explosive charge of 40–70% can be attributed to similar values of porosity and content of crystalline phase. The scratch and spalling mechanisms are the main mechanisms of material removal from the coatings.



# Что дальше?

## Повышение качества предсказаний и дальнейшие перспективы

- использовать названия статей и ключевые слова
- создать новые признаки, связанные со временем и/или залогом совестных конструкций
- реализация нейросетевой модели
- добавление в выборку журналов баз *Springer* и *Elsevier*





Novosibirsk State  
Technical University  
**NETI**

# **Science или Nature? Рекомендательная система выбора журнала для научной публикации**

Иванов Иван Владимирович  
e-mail: [ivanivanov@vivaldi.net](mailto:ivanivanov@vivaldi.net)  
TG: ivanvivanov

Новосибирск, 2022