Generalized Fermat's Last Theorem(2) $R^n = y_1^4 - y_2^4$

Chun-Xuan Jiang
P. O. Box 3924, Beijing 100854. China
jcxuan@sina.com

Abstract

In this paper we prove $R^n = y_1^4 - y_2^4$ has no nonzero integer solutions for $n \geq 2$.

We define the supercomplex number [1,2,3]

$$W = x_1 + x_2 J + x_3 J^2 + x_4 J^3 \qquad (1)$$

where J denotes a $4-th$ root of unity, $J^4 = 1$,

Then from (1) we have

$$W^n = (x_1 + x_2 J + x_3 J^2 + x_4 J^3)^n = y_1 + y_1 J + y_2 J^2 + y_3 J^3 \qquad (2)$$

Then from (2) we have the modulus of supercomplex number

$$R^n = |y_i| \qquad (3)$$

where

$$R = x_1^4 - x_2^4 + x_3^4 - x_4^4 - 2(x_1^2 x_3^2 - x_2^2 x_4^2) + 4(x_1 x_3 x_2^2 + x_1 x_3 x_4^2 - x_2 x_4 x_1^2 - x_2 x_4 x_3^2), \qquad (4)$$

$$|y_i| = y_1^4 - y_2^4 + y_3^4 - y_4^4 - 2(y_1^2 y_3^2 - y_2^2 y_4^2) + 4(y_1 y_3 y_2^2 + y_1 y_3 y_4^2 - y_2 y_4 y_1^2 - y_2 y_4 y_3^2), \qquad (5)$$

y_i are homogeneous and irreducible polynomials. We prove that (3) has infinitely many nonzero integer solutions.

We define the stable group [1,4]

$$G = \{g_2, g_4\} \qquad (6)$$

where

$$g_2 = \begin{pmatrix} 1\,2\,3\,4 \\ 1\,2\,3\,4 \end{pmatrix}, g_4 = \begin{pmatrix} 1\,2\,3\,4 \\ 1\,4\,3\,2 \end{pmatrix}$$

We have

$$\begin{aligned} g_4: &\quad x_1 \to x_1, \quad x_2 \to x_4, \quad x_3 \to x_3, \quad x_4 \to x_2 \\ g_4: &\quad y_1 \to y_1, \quad y_2 \to y_4, \quad y_3 \to y_3, \quad y_4 \to y_2, R \to R \end{aligned} \qquad (7)$$

Theorem 1. From (7) we have

$$g_4 y_1 = y_1 = 0, g_4 y_2 = y_4 = 0, \; g_4 y_3 = y_3 = 0, g_4 y_4 = y_2 = 0 \qquad (8)$$

$y_1 = y_2 = 0, y_1 = y_4 = 0,\ y_2 = y_3 = 0$ and $y_3 = y_4 = 0$ every group has no nonzero integer solutions, have only trivial solutions $y_1(x_1, 0, 0, 0) = x_1^n$, $y_i(x_1, 0, 0, 0) = 0, i = 2, 3, 4$; $y_i(0, 0, 0, 0) = 0, i = 1, 2, 3, 4$ [5].

Theorem 2. Suppose $n = 2$ and $y_3 = y_4 = 0$. From (3) and (5)

$$R^2 = y_1^4 - y_2^4 \quad (9)$$

when $n = 2$ from (2)

$$y_1 = x_1^2 + x_3^2 + 2x_2x_4,\ y_2 = 2(x_1x_2 + x_3x_4), y_3 = x_2^2 + x_4^2 + 2x_1x_3,\ y_4 = 2(x_1x_4 + x_2x_3), \quad (10)$$

From (10) $y_3 = y_4 = 0$ we have

$$x_4 = \frac{x_1^2 \pm \sqrt{x_1^4 - x_2^4}}{x_2} \quad (11)$$

If (11) has rational solutions, then

$$R_1^2 = x_1^4 - x_2^4 \quad (12)$$

Fermat proves that (12) has no nonzero integer solutions, $R_1 < R$, Using method of infinite descent we prove that (9) has no nonzero integer solutions. Hence we prove that theorem 1. $y_3 = y_4 = 0$ has no nonzero integer solutions.

From (7) and (9)

$$(g_4R)^2 = (g_4y_1)^4 - (g_4y_2)^4, \quad (13)$$

$$R^2 = y_1^4 - y_4^4 \quad (14)$$

From (10) $y_2 = y_3 = 0$

$$x_4 = \frac{x_1^2 \pm \sqrt{x_1^4 - x_4^4}}{x_4} \quad (15)$$

If (15) has rational solutions, then

$$R_1^2 = x_1^4 - x_4^4 \quad (16)$$

Fermat proves that (16) has no nonzero integer solutions, $R_1 < R$, Using method of infinite descent we prove that (14) has no nonzero integer solutions. Hence we prove that theorem 1. $y_2 = y_3 = 0$ has no nonzero integer solutions.

Suppose $y_1 = y_2 = 0$ From (3) and (5)

$$R^2 = y_3^4 - y_4^4 \qquad (17)$$

From (10) $y_1 = y_2 = 0$

$$x_1 = \frac{x_2^2 \pm \sqrt{x_2^4 - x_3^4}}{x_3} \qquad (18)$$

If (18) has rational solutions then

$$R_1^2 = x_2^4 - x_3^4 \qquad (19)$$

Fermat proves that (19) has no nonzero integer solutions, $R_1 < R$, Using method of infinite descent we prove that (17) has no nonzero integer solutions. Hence theorem 1 $y_1 = y_2 = 0$ has no nonzero integer solutions.

From (7) and (17) we have

$$(g_4 R)^2 = (g_4 y_3)^4 - (g_4 y_4)^4 \qquad (20)$$

$$R^2 = y_3^4 - y_2^4 \qquad (21)$$

From (10) $y_1 = y_4 = 0$

$$x_3 = \frac{x_2^2 \pm \sqrt{x_2^4 - x_1^4}}{x_1} \qquad (22)$$

If (22) has rational solutions, then

$$R_1^2 = x_2^4 - x_1^4 \qquad (23)$$

Fermat proves that (23) has no nonzero integer solutions, $R_1 < R$, Using method of infinite descent we prove that (21) has no nonzero integer solutions. Hence theorem 1 $y_1 = y_4 = 0$ has no nonzero integer solutions.

Theorem 3. Suppose $n = 4$ and $y_3 = y_4 = 0$ from (3) and (5)

$$R^4 = y_1^4 - y_2^4 \qquad (24)$$

Fermat proves that (24) has no nonzero integer solutions, Hence theorem 1. $y_3 = y_4 = 0$ has no nonzero integer solutions.

Suppose $n = 4$ and $y_2 = y_3 = 0$ from (3) and (5)

$$R^4 = y_1^4 - y_4^4 \qquad (25)$$

Fermat proves that (25) has no nonzero integer solutions, Hence theorem 1. $y_2 = y_3 = 0$ has no nonzero integer solutions.

Suppose $n = 4$ and $y_1 = y_4 = 0$ from (3) and (5)

$$R^4 = y_3^4 - y_2^4 \qquad (26)$$

Fermat proves that (26) has no nonzero integer solutions, Hence theorem 1. $y_1 = y_4 = 0$ has no nonzero integer solutions.

Suppose $n = 4$ and $y_1 = y_2 = 0$ from (3) and (5)

$$R^4 = y_3^4 - y_4^4 \qquad (27)$$

Fermat prove that (27) has no nonzero integer solutions, Hence theorem 1. $y_1 = y_2 = 0$ has no nonzero integer solutions.

Theorem 4. Suppose $n = 3$ and $y_3 = y_4 = 0$ from (3) and (5)

$$R^3 = y_1^4 - y_2^4 \qquad (28)$$

Since $y_3 = y_4 = 0$ has no nonzero integer solutions. Hence (28) has no nonzero integer solutions.

Theorem 5. Suppose $n > 4$ and $y_3 = y_4 = 0$ from (3) and (5)

$$R^n = y_1^4 - y_2^4 \qquad (29)$$

Since $y_3 = y_4 = 0$ no nonzero integer solutions. Hence (29) has no nonzero integer solutions.

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本期责编：宋正海（中国科学院自然科学史所）

主题：国际数学家网上发文费马大定理证明权应是蒋春暄而不是怀尔斯

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[编者按]再次恳请数学界有关权威和领导严格审查蒋春暄费马大定理成果

费马大定理证明权究竟是美国的怀尔斯还是中国的蒋春暄，这已在中国学术界争论许多年，影响很大。蒋春暄证明的公布早于怀尔斯，这是铁的事实。但国际数学界仍把菲尔兹奖（数学最高奖）颁发给怀尔斯，这对中国是极大的遗憾。这种学术不公或许对中国数学界是个无奈。

但问题是后来中国数学界某些头面人物的行为是难于使国人理解的。他们一方面主动（并非无奈）在中国大肆宣传怀尔斯。还无视蒋春暄抗议和许多学者责问，极力把中国自己设的邵逸夫奖拱手送给怀尔斯乃至他的学生。另一方面，又不作任何具体的证明和说明，蛮横地说蒋春暄没有证明费马大定理。受到何祚庥和方舟子的攻击被打成伪科学。中国到今天仍不承认蒋春暄 1991 年证明费马大定理。

近几年国际数学界有很大变化。（1）2009 年蒋春暄主要因费马大定理的证明而获得特勒肖-伽利略科学院金奖。（2）尽管蒋春暄这几年脾气越来越大，在国际数学界不讲礼貌地挑战怀尔斯及有关著名费马大定理研究专家，但怀尔斯等人任凭蒋的野蛮挑战而无还手能力。其实按照他们的数论水平，如果确认蒋的证明是错误的，那只要指出其错误之处，就可以把蒋的嚣张气焰轻易地压下去，但奇怪的是这些受蒋气的国际数论大家没有一个敢啃声，敢出来否定蒋的证明。
本期快讯转载刚被译成中文的 2009 年数论家 HimalayanHigari 在网上文章有关部分。文章指出，是中国人蒋春暄而不是美国人怀尔斯证明了费马大定理。文章竟称怀尔斯是"小偷"，剽窃了蒋春暄的想法。
天地生人学术讲座提出并支持讨论蒋春暄现象，但也经常批评他的谩骂做法，这里我们也不完全同意这位年轻学者的用词。但人们只要联系有关蒋春暄现象的种种怪事，就会感到这位外国数学家的话可能已接近揭露事实的真相。为此特载如下，供关心者深思。我们再一次恳请数学界有关权威和领导严格审查蒋春暄数论成果，明确告诉国人。事关国家利益和民族荣誉，不能再稀里糊涂不理不睬。

费马大定理是 1637 年由法国业余数学家费马提出，全世界所有数学家没全完解决,1973 年蒋春暄提出一种新的证明方法,1978 年 7 月 19 日下午在中科院数学所讨论会上被否定，其实这时已证明费马大定理，经过改进于 1991 年 10 月 25 日证明费马大定理，这更简单更清楚，这种证明向国内外散发 600 份, 1992 年一月十五寄普林斯顿大学等世界大学，寄王元杨乐等中国数学家，收到中国著名数论家乐茂华肯定。这时中科院数学所王元杨乐召开新闻发布会，他们宣布无论中国有多少人都不能证明哥德巴赫猜想和费马大定理，只能在<潜科杂志>上发表。这次国际费马大定理证明权之争是一件大事，国际以日本德国法国英国等一批顶尖数学家共同工作最后由普林斯顿大学怀尔斯完成，与中国蒋春暄关于费马大定理证明权之争。这是中国蒋春暄和当代一大批顶尖数学家之争，最后蒋春暄会胜利，这快 400 年数学难题，蒋春暄证明简单清楚。这样事在数学史上没有的。但中科院为首数学界都支持怀尔斯，这件事在中国也闹了一段时间。现在 HimalayanHigari 出来说话用事实证明费马大定理首先证明权是蒋春暄而不是小偷怀尔斯。蒋春暄 1994 年在美国发表费马大定理论文，而怀尔斯 1995 年由他主编杂志上发表费马大定理论文，这就是事实。中国中科院应该解决这个问题，拖下去对中科院没有好处。蒋春暄 1973 年就用这种新方法证明费马大定理，其实 1978 年 7 月 19 日下午在中科院数学所讨论会一文就证明了费马大定理，最近重写这篇论文,1991 年证明费马大定理一文是在 1978 年论文基础上改进，方法和思路没有改变。国外宣布 Chinese proved it first. 以胡锦涛为首中国政府应该向全世界宣布 Chinese proved Fermat last theorem first. 这是中国有史以来最大数学成就。这可与人类登月发现原子核分裂发现 DNA 相提并论的成果，是 20 世纪最伟大的成果之一，比奥运会和世博会意义至少大一万倍，这是人类思想和脑力最高峰！这么大成果这么大荣誉中华民族不需要，怎么也说不过去！中科院为了他自身利益，不需要这样成果不承认这样成果，他们到今天仍在宣传小偷怀尔斯，不允许中国任何单位和个人支持 Chinese 证明费马大定理.
主题：网上有关蒋春暄介绍费马大定理部分
发件人: Chen I-wan [mailto:cheniwan@263.net]
发送时间: 2011 年 3 月 13 日 20:21
Fermat's Last Theorem Part 5
http://www.maa-bih.org/difficult-mathematics-problems/fermats-last-theorem-part-5#comment-333
4. spudd86 Says:
April 15th, 2009 at 7:09 pm

I think you'll find ...

I think you'll find Jiang Chun Xuan claims that Wiles's proof is false, which leads me to believe that his proof is flawed, since Wiles's proof HAS passed extensive peer review,

我想你们可以发现蒋春暄声称怀尔斯的证明是错误的，这引导我认为他（蒋春暄）的证明有缺陷，因为怀尔斯的证明通过了广泛的同行审查，

9. HimalayanHigari Says:

April 15th, 2009 at 7:09 pm

Just email Ruggiero ...

Just email Ruggiero Santilli He published a chinese proof before 1995.

你可以发邮件给桑蒂利。他 1995 年前出版了这个中国人(蒋春暄 1994)的证明。

All the scientists who read Jiangs proof all refused to comment or even disporve. Because none of them can disprove the chinese solution. Mr Santilli was the only one to have comment on his work.

读了蒋春暄的证明的所有科学家全部拒绝发表意见，甚至拒绝否定蒋春暄的证明。因为他们中没有一个人能够否定中国人的这个解决方案。桑蒂利先生是唯一对他的工作发表意见的人。

12. HimalayanHigari Says:

April 15th, 2009 at 7:09 pm

Shitface monkey! ...

face monkey! chinese proved it first, Jiang Chun Xuan mailed his paper to Princeton where this thief worked and he stole jiangs ideas. Filthy liars, witout th chinese guy this thief could never prove the theorem. U Wiles.

正视现实！中国人首先证明了它(费马大定理) ，蒋春暄将他的论文寄给了普林斯顿，那个小偷工作的地方，他偷了蒋的想法。肮脏的说谎者，没有这个中国人(蒋春暄)这个小偷不可能证明这个定理。你怀尔斯。