(I) Some of the most serious cases of plagiarism by Prof. B.S. Rajput (and his collaborators) from Kumaun University, Nainital

In addition to the case of plagiarism from the paper of R. Kallosh, we have found some other cases which are almost equally serious. Among the papers listed below, papers 1 and 2 represent the most serious cases of plagiarism, in that they have not even added reference to the papers from where the results are taken. Paper 3 does refer to the papers from where the material is taken; however it gives the impression that these are new results rather than results derived by others earlier. This is apparent by looking at the abstract of the paper, which is supposed to contain the list of new results, while in practice these turn out to be results derived by others earlier.

1. We shall start with the paper of S. C. Joshi and B. S. Rajput, "Angular Momentum Operator and Fermion-Pair Creation for Non-abelian Fields", Int. J. Theor. Physics **41** (2002) 459. Most of the scientific content of this paper is copied from ref.[1] by Rubakov, with the word "monopole" replaced by "dyon" everywhere. The correspondence is as follows:

   Part of section 1 of Joshi-Rajput ↔ Section 1 of ref.[1]

   Section 3 of Joshi-Rajput ↔ Section 2 of ref.[1]

   Section 4 of Joshi-Rajput ↔ Section 3 of ref.[1]

   Section 5 of Joshi-Rajput ↔ Section 4 of ref.[1]

   Section 6 of Joshi-Rajput ↔ Section 7 of ref.[1]

   Appendix A of Joshi-Rajput ↔ appendix A1 of ref.[1]

   Appendix B of Joshi-Rajput ↔ appendix A2 of ref.[1]

   Eq.(3.4), (3.5) in the Joshi-Rajput paper contains Julia-Zee dyon solutions instead of 't Hooft-Polyakov monopole solution in Rubakov's paper.

To see an example of plagiarism, compare the following paragraphs from the two papers:

Joshi-Rajput page 473:

In the vacuum sector, fermion-number-breaking matrix elements are also suppressed by negative powers of c ('t Hooft, 1976b). This suppression occurs because the zero fermion modes far from the instanton are proportional to $\lambda_{\text{inst}}^{-3/2}$, and the instanton size λ_{inst} is bounded from above by c^{-1}. Thus, it is instructive to investigate the zero fermion modes in the external field (3.10) in order to find their c dependence. For the sake of convenience we consider the fields a_0 and a_1 of the form (3.16). Since the external field is spherically symmetric, it is natural to choose a spherically symmetric anstaz for the zero modes.

Rubakov[1] page 317:

In the vacuum sector, fermion number breaking matrix elements are also suppressed by negative powers of c [14]. This suppression occurs because the zero fermion modes far from the instanton are proportional to $\lambda_{\text{inst}}^{-3/2}$ and the instanton size λ_{inst} is bounded from above by c^{-1}. Thus, it is instructive to investigate the zero fermion modes in the external field (2.11) in order to find their c dependence. For the sake of convenience we consider the fields a_0, a_1 of the form (2.17). Since the external field is spherically symmetric, it is natural to choose a spherically symmetric ansatz for the zero modes.

No reference to Rubakov's Nuclear Physics paper[1] is given. We find this to be the most blatant case of plagiarism among the papers discussed in this report.

2. A paper of M. P. Singh and B. S. Rajput, "BPS Spectra of Dyons in four dimensional N=2 supersymmetric theories", was published in Prog. Theor. Physics **102** (1999) 843.

   The scientific content of this paper is cleverly copied from a couple of papers by Bilal and Ferrari [4, 5]. Parts of section 2 has been taken from ref.[2], but since this is introductory material one could think of this as a review of known results. The scientific content of the other part of section 2 has been taken from ref.[4] without giving any reference to this paper. In this part the copying is not direct, and it would require an expert to check this. Some examples are explicit, for example eq.(2.32) of Singh-Rajput is the same as eq.(4.7) of ref.[4] with identical notation. There are also other examples of this kind.

   However the case of plagiarism becomes more explicit in section 3 most of whose scientific content has been taken from ref.[5] without giving any reference to this paper. In particular the corrspondence is as follows:

   Section 3(a) of Singh-Rajput $\leftrightarrow$ Section 3 of [5]

   Section 3(b) of Singh-Rajput $\leftrightarrow$ Section 4 of [5]

   Section 3(c) of Singh-Rajput $\leftrightarrow$ Section 5 of [5]

   In this section often equations and part of the text have been copied from ref.[5] with identical convention, which makes it clear that Singh and Rajput have in fact taken the material directly from ref.[5].

   An interesting point to note is the following. In going from eq.(3.10) to (3.11) in the Singh-Rajput paper, one needs to set $\Lambda_1^6 = 256/27$. This of course is explicitly mentioned in the ref.[5] as their eq.(3.4), but not mentioned in the Singh-Rajput paper. Without this choice of Λ_1, eq.(3.11) and many other subsequent equations of the Singh-Rajput paper will be wrong.

Here is a comparison between some parts of the text in Singh-Rajput with Bilal-Ferrari[5]:

Singh-Rajput, p 855:

Thus all strong coupling states come in Z_3-triplets:

$$\begin{pmatrix} \mathbf{n_e} \\ \mathbf{n_m} \end{pmatrix} \overset{\mathbf{G_{S,+}}}{\longrightarrow} \begin{pmatrix} -\mathbf{n_m} \\ \mathbf{n_e} + \mathbf{n_m} \end{pmatrix} \overset{\mathbf{G_{S,+}}}{\longrightarrow} \begin{pmatrix} -\mathbf{n_e} - \mathbf{n_m} \\ \mathbf{n_e} \end{pmatrix} \overset{\mathbf{G_{S,+}}}{\longrightarrow} - \begin{pmatrix} \mathbf{n_e} \\ \mathbf{n_m} \end{pmatrix},$$

Bilal-Ferrari[5], p 609:

all strong-coupling states come in Z_3 triplets:

$$\begin{pmatrix} \mathbf{n_e} \\ \mathbf{n_m} \end{pmatrix} \overset{\mathbf{G_{S+}}}{\longrightarrow} \begin{pmatrix} -\mathbf{n_m} \\ \mathbf{n_e} + \mathbf{n_m} \end{pmatrix} \overset{\mathbf{G_{S+}}}{\longrightarrow} \begin{pmatrix} -\mathbf{n_e} - \mathbf{n_m} \\ \mathbf{n_e} \end{pmatrix} \overset{\mathbf{G_{S+}}}{\longrightarrow} - \begin{pmatrix} \mathbf{n_e} \\ \mathbf{n_m} \end{pmatrix}.$$

Also consider Singh-Rajput, eq.(3.23) in p855:

$$\begin{aligned} \mathbf{S_{S0}} &= \{\pm(\mathbf{0},\mathbf{1}); \pm(-\mathbf{1},\mathbf{1}); \pm(\mathbf{1},\mathbf{0})\}, \\ \mathbf{S_{S+}} &= \{\pm(\mathbf{1},\mathbf{0}); (-\mathbf{1},\mathbf{1}); \pm(\mathbf{2},-\mathbf{1})\} = \mathbf{M_{u_1}} \mathbf{S_{S0}}, \\ \mathbf{S_{S-}} &= \{\pm(\mathbf{0},\mathbf{1}); \pm(-\mathbf{1},\mathbf{0}); \pm(\mathbf{1},\mathbf{1})\} = \mathbf{M_{u_3}^{-1}} \mathbf{S_{S0}}. \end{aligned}$$

Bilal-Ferrari[5], eq.(3.33), p 609:

$$\begin{aligned} \mathbf{S_{S0}} &= \{\pm(\mathbf{0},\mathbf{1}); \pm(-\mathbf{1},\mathbf{1}); \pm(\mathbf{1},\mathbf{0})\}, \\ \mathbf{S_{S+}} &= \{\pm(\mathbf{1},\mathbf{0}); \pm(-\mathbf{1},\mathbf{1}); \pm(\mathbf{2},-\mathbf{1})\} = \mathbf{M_{u_1}} \mathbf{S_{S0}}, \\ \mathbf{S_{S-}} &= \{\pm(\mathbf{0},\mathbf{1}); \pm(-\mathbf{1},\mathbf{0}); \pm(\mathbf{1},\mathbf{1})\} = \mathbf{M_{u_3}^{-1}} \mathbf{S_{S0}}. \end{aligned}$$

Note that above equations of the Singh-Rajput paper (which have clearly been taken from Bilal-Ferrari) give one of the main results claimed to be derived in the Singh-Rajput paper. No reference to the Bilal-Ferrari papers has been given. In our view this paper of Singh and Rajput constitutes an equally serious (although slightly less obvious) case of plagiarism as the previous paper.

3. A paper of S. C. Joshi, M. P. Singh, V. P. Pandey and B. S. Rajput, "$N = 4$ Supersymmetric (Dyonic) Hypermultiplets in String Theory", was published in Int. J. Theor. Physics. **41** (2002) 1107. Most of the scientific content of this paper is taken from refs.[2, 3, 4, 5, 6]. The correspondence is as follows:

   Results in section 2 of Joshi *et. al.* ↔ section 16 of ref.[3]

   Section 3 of Joshi *et. al.* ↔ rewriting of the results of [2], as reviewed, for example, in refs.[4, 5]

   Section 4 of Joshi *et. al.* ↔ various parts of ref.[6] in a slightly different normalization convention.

   There is unmistakable sign of plagiarism, since whole parts have been lifted from the earlier papers with a few minor changes in wording. This is quite explicit in sections 2 and 4. Compare for example section 2 of Joshi *et. al.* and section 16 of ref.[3]:

   Part containing eq.(2.1)-(2.10) of Joshi *et. al.* ↔ Part containing Eq.(16.1)-(16.10) of ref.[3]

   Part containing eq.(2.11)-(2.20) of Joshi *et. al.* ↔ Part containing Eq.(16.15)-(16.25) of ref.[3]

   Incidentally, the authors acknowledge ref.[3] for their eq.(2.1) which is a well-known statement that $N = 4$ supersymmetric Yang-Mills theory has a dimensionless complex coupling constant.

Here is a comparison of the text in Joshi et. al. with a text in ref.[3]:

Joshi *et. al.*, p 1111: **This analysis is valid for very weak coupling. Could it be, for instance, that what we described above as one conjugate to T, separated by an amount that vanishes for weak coupling. SL(2,Z) group theory alone would permit this, but it is impossible because each of the singularities arises when a single hypermultiplet becomes massless.**

Seiberg-Witten[3], paragraph above eq.(16.15):

Of course, the above analysis was valid for very weak coupling. Could it be, for instance, that what we described above as one singularity conjugate to T^2 is really a pair of singularities **conjugate to T, separated by an amount that vanishes for weak coupling? SL(2,Z) group theory alone would permit this, but it is impossible because each of the singularities arises when a single hypermultiplet becomes massless.**

We have highlighted in boldface the text from Joshi *et. al.* and the part of the text from Seiberg-Witten which was copied. Note that in the process of copying, some part of the text of Seiberg-Witten was inadvertently dropped by Joshi *et. al.* (or it could be an error in proof-setting). Without this part, the Joshi *et. al.* text does not even make sense.

Had this been a review article, one could even excuse this. However, these results are presented as new results. It is clear from their abstract (which is supposed to contain a summary of the new results) and the introductory section that all the results claimed to be derived in this paper are results derived earlier by others:

1) The paper claims to find the exact metric in the moduli space of N=4 supersymmetric field theories. This was done earlier by Seiberg and Witten.

2) It claims to find the spectrum of BPS states at strong and weak coupling. This was done by Seiberg-Witten and by Bilal-Ferrari.

3) It claims to identify the hypermultiplets, – in particular those which become massless at the singularities in supersymmetric Yang-Mills the-

ory, – as open string stretched between D3 and D7 branes. This was done by Bergman and Fayyazuddin.

References

[1] V. A. Rubakov, "Adler-Bell-Jackiw Anomaly And Fermion Number Breaking In The Presence Of A Magnetic Monopole," Nucl. Phys. B **203**, 311 (1982).

[2] N. Seiberg and E. Witten, "Electric - magnetic duality, monopole condensation, and confinement in N=2 supersymmetric Yang-Mills theory," Nucl. Phys. B **426**, 19 (1994) [Erratum-ibid. B **430**, 485 (1994)] [arXiv:hep-th/9407087].

[3] N. Seiberg and E. Witten, "Monopoles, duality and chiral symmetry breaking in N=2 supersymmetric QCD," Nucl. Phys. B **431**, 484 (1994) [arXiv:hep-th/9408099].

[4] F. Ferrari and A. Bilal, Nucl. Phys. B **469**, 387 (1996) [arXiv:hep-th/9602082].

[5] A. Bilal and F. Ferrari, Stability and Weak and Strong-Coupling BPS Spectra in $N = 2$ Supersymmetric QCD," Nucl. Phys. B **480**, 589 (1996) [arXiv:hep-th/9605101].

[6] O. Bergman and A. Fayyazuddin, "String junctions and BPS states in Seiberg-Witten theory," Nucl. Phys. B **531**, 108 (1998) [arXiv:hep-th/9802033].