In response to your *Request for investigation on reported results* about a paper (Iye et al. 2021, ApJ 907, 123), the committee in National Institutes of Natural Sciences have verified your claim and the paper's main conclusion. The followings arethe results.

Verification of your claim

From your web site, we have downloaded the data that you mentioned in your request. We understand that the data is provided by the Authors through ApJ editor Brad Gibson. The number of S/Z galaxies in each hemisphere you defined are summarized below, which is consistent with what you showed in the request.

Table 1: Number of galaxies in the downloaded data

Hemisphere(RA)	Number of Z : N_z	Number of S: N_s	Total N
(I) 70° ~ 250°	23037	22442	45479
(II) $< 70^\circ, > 250^\circ$	13660	13749	27409
Total	36697	36191	72888

You claim that N_z is larger than N_s in Hemisphere (I) by more than two sigma. We will try to verify this statement, here. We first consider the binomial distribution whose probability is p =1/2. Because the number of sample, N, is large enough, binomial distribution can be regarded as Gaussian distribution where the standard deviation is $\sigma = p\sqrt{N}$. In this case, the significance of the statement $N_z > N_s$ is calculated as,

$$\frac{N_z - pN}{\sigma} = 2.8 \qquad (1)$$

If we consider Bonferroni-corrected probability, where we have two independent observables when we divide the hemisphere into two, the significance is calculated to be 2.3. In each case, the significance exceeds 2.0. Therefore, your claim is verified.

In Hemisphere (II), the large and small relationship is in reverse, $N_z < N_s$. However, its significance is much smaller; 0.54 σ. This suggests that if non-uniformity exist, it is NOT likely to have a dipole-like structure.

Verification of the paper's main conclusion

Iye et al. estimated the significance of the 0-th and 1st-order terms (DC and dipole) of the Legendre expansion of the non-uniformity.

Without splitting the samples, and substituting, N_z = 36697, N = 72888 from Table 1into Eqn (1), we obtain the significance of 1.87. This is the significance of the DC component, and is consistent with the statement in Iye et al. saying "Number dominance of Z-spirals over S-spirals is also

only at the $\sigma_N = 1.87$ level". The smaller significance compared to 2σ is natural consequence of the opposite N_s / N_z larger and smaller relations of the two Hemispheres.

The dipole component is defined as D_{max} in Iye et al. We also calculate D_{max}, which we think the paper's main evaluation index, independently from authors. The result is $D_{max} = 0.0053490$ and this is consistent with what they show (0.00535) in Section 3.2. In the paper, authors estimate the significance from simulations. Because it is hard to verify the detail of simulations, we here calculate the analytic solution by Chandrasekhar (1943) which assumes uniform samples in the hemisphere. The comparisons of the analytic solution and the simulation results of Iye et al. are shown in the following.

	Analytic Solution	Simulation by Iye+
Average $<D_{max}>$	0.003412	0.00336
Standard Deviation σ	0.001440	0.00154
$(D_{max} - <D_{max}>) / \sigma$	1.35	1.29

We find no significant difference between those two and the deviation would be explained by the non uniformity of sample distribution.

We consider that the low significance of D_{max} is consistent with the low significance of $N_z - pN$ in Hemisphere (II) as we already mentioned at the end of the previous section.

Conclusion

We verify your claim and paper's result. It turned out that both are correct. The claim and Iye et al. uses totally different methods and the sensitivity of a method depends on the nature, in this case how the S and Z galaxies are distributed in the sky. Therefore it is quite natural that two methods give different results. We consider that this is directly connected to scientific considerations which should be argued on papers.