Comparison of angular sizes for supernovas at z=0.151 and z=2.9 confirms the great resolution of JWST and confirms the presence of the light scattering. Tired light formula fits the angular size of standard object like supernova surprisingly well on all distances.

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Abstract.

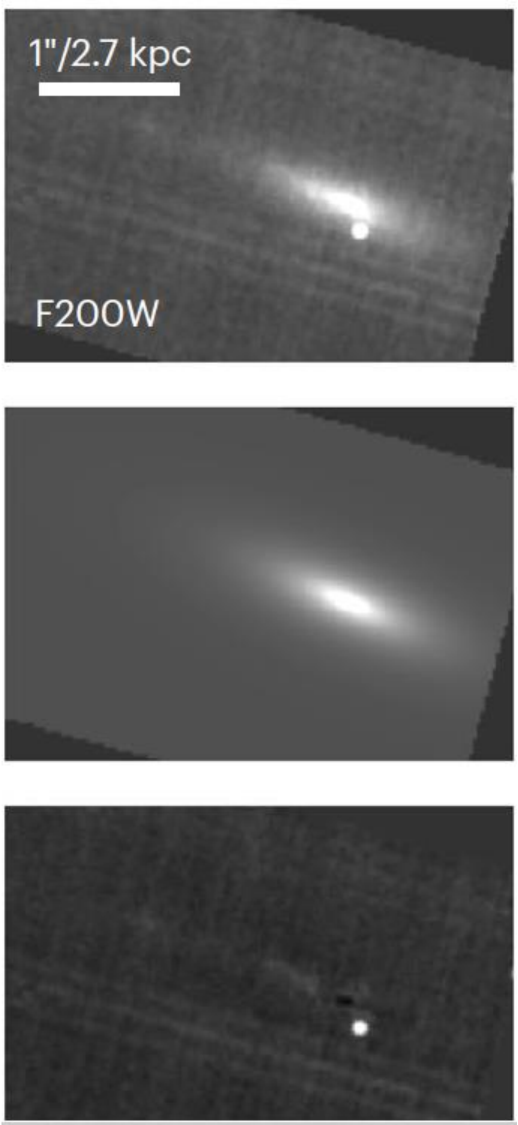
As it was shown in [1] the blurred images of the far galaxies (for z well above 10) confirmed the presence of the undiscovered yet mechanism of light scattering and makes strong hint toward the tired light theory instead of Big Bang. The idea was applied to the more close and well researched objects like supernovas with similar success [2,3]. In this publication I compare the angle size of two supernovas (one is close, one is relatively far) to demonstrate that light scattering is not due to telescope itself (the close supernova has a size close to the diffraction limit, as expected) but due to the presence of the light scattering very slowly accumulated as light propagates toward Earth and finally directly observed (the far supernova has the angle size many times the diffraction limit, what means that telescope has a great resolution power and the effect of light scattering is real). Fitting with the simple formula outlined in [1] gives surprisingly good accuracy for both cases.

Introduction.

The problems Big Bang encountered after launch of JWST are so numerous now, that the search for the alternative theory is underway. The most researched competitor is tired light theory, which is modified for the case of very small interactions in [1] (so billions and trillions of small scattering events are necessary to have observable change in position of spectra). In [1] formulas are derived for the angular size of scattered light and red shift as a function of z observed. In [2,3] this approximation is applied for the much more standard object like supernova type 1a and again the direct observation of the light scattering is confirmed. In this publication the comparison of close and far supernovas is made to eliminate the possibility of the experimental error (telescope is not as good as expected and light scattering is not real, but rather the experimental artifact).

Main part.

In [4] the observation of the supernova for the small z is published with excellent pictures:



It is easy to measure the angular size of the supernova at z=0.151 reported in [4] since the ruler is placed directly on the image: for JWST camera F200W (center wavelength is 2 um [5]) the angle is 0.111" (arcseconds) or 5.38*10exp(-7) rad. Evaluation of the diffraction limit of the James Webb Space Telescope is according to famous formular resolution=λ/D, where λ is the wavelength of the observation (in our case 2 um) and D is the diameter of the main mirror of the telescope (in our case 6.5 m). According to this formula the resolution would be 2*10exp(-6)/6.5=3*10exp(-7). Indeed the size of supernova is close to the diffraction limit as it is mentioned in [4] ("a clear point source is detected at the location of GRB 221009A").

Evaluation of the angular size of the object using the formulas from [1] gives:

Angle=sqrt(N)*α, $E_n/E_o=(1-\alpha)^N$, α=2.01*10exp(-12)

Here N is number of scatterings for tired light hypothesis (extremely big number), α is the parameter of relative energy loss at each event (usual for tired light hypothesis formula ΔE/E=-α*E is used), En is the energy of photon after N scattering, E_o is the initial energy of photon just emitted, and *Angle* is mean deviation of the angle of the light propagation due to scattering (diffusion-like approach in the perpendicular to light propagation direction and ideal chain approximation are used, see [1]).

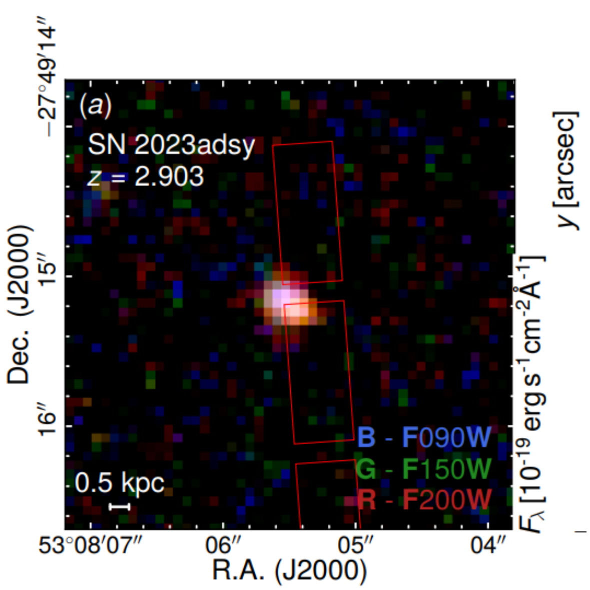
Calculations for z=0.151 yield:

E_n/E_o=1/(1+z), N*ln(1-α)=ln(1/1.151), N=0.1406/2.01*10exp(-12)=7*10exp(10)

Angle=sqrt(7)*10*exp(5)*2.01*10exp(-12)=5.32*10exp(-7)

Which is in surprisingly excellent agreement with the measured value of 5.38*10exp(-7) – this is of course by pure accident because the values are so close to the diffraction limit. Yet it emphasizes the simple fact – JWST is well tuned and delivers images with the resolution exactly as expected, no bad experimental problems here.

As far as second supernova at z=2.9 is concerned the image was published in [6]:



The visible diameter of the supernova type 1a is around 0.35 arcsecond, which would correspond to 1.70*10exp(-6) rad, that is around 5.7 times higher than the diffraction limit (note, that the same camera F200W is used in both cases, so the comparison is fair). The same calculations as above yield:

Angle=α*sqrt(N); 1/(1+z)=$(1-\alpha)^N$, α=2*10exp(-12) from [1]

for z=2.9 we have: N=0.68*10exp(12)

Angle=2*10exp(-12)*0.825*10exp(6)=1.65*10exp(-6)

Which is very close to the calculated angle of scattering of 1.7*10exp(-6) and much higher than it should be from diffraction limit perspective (well above any possible error).

No physical mechanism may be responsible for supernova having so big real size (size of small, not dwarf, galaxy [3]). Only light scattering may be responsible, the property of the information carrier itself, not the object under investigation. On the opposite, the further the supernova, the smaller the angular size it should have (and because of the diffraction limit of the telescope, all supernovas except for very close with z~0 must be presented exactly by one dot in diffraction sense). Any observed resolution means the light scattering is present which in turn means that the Big Bang theory should be re-analyzed again -so great would be the tired light hypothesis fitting numerous observation data.

Conclusion.

In addition to the blurred images of far galaxies the observation of the supernovas (well researched object with many standard features present) confirms once again the tired light hypothesis (great accuracy of the fit of the experimentally observed angle size is achieved) and disproves Big Bang Theory.

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