1. From Chalmers, 2010:

It is a central fact about experience that it has a complex structure. ... Take color experiences as an example. For every distinction between color experiences, there is a corresponding distinction in processing. The different phenomenal colors that we experience forms a complex three-dimensional space, varying in hue, saturation, and intensity.... The three-dimensional structure of phenomenal color space ... corresponds directly to the three dimensional structure of visual awareness.

This principle [of 'structural coherence'] has its limits. It allows us to recover structural properties of experience from information-processing properties, but not all properties of experience are structural properties. There are properties of experience, such as the intrinsic nature of a sensation of red, that cannot be fully captured in a structural description. The very intelligibility of inverted spectrum scenarios, where experiences of red and green are inverted but all structural properties remain the same, show that structural properties constrain experience without exhausting it. (Chalmers 2010, 21-22)

2. If inversion preserves functional isomorphism then

there is a way of mapping determinate shades of color onto determinate shades of color which is such that ... the mapping preserves, for any normally sighted person, all of the 'distance' and 'betweenness' relationships between the colors (so that if shades a, b, and c are mapped onto shades d, e, and f, respectively, then a normally sighted person will make the same judgments of comparative similarity about a in relation to b and c as about d in relation to e and f) (Shoemaker 1975)

3. A symmetrical color quality space:

4. Adding the stimulus classes for these experiences:

5. From Sydney Shoemaker, The First Person Perspective and Other Essays, Cambridge University Press, 1996:

Each change involves a change in the structure of the quality space in which two shades "change places", each coming to appear the way the other did previously, the appearance of all of the other shades remaining unchanged, this being followed by an "accommodation" in which the intentional content of the experiences adjust to the change. Two different shades are involved in each change. After the final change, all shades have changed their appearance, the original structure of the quality space has been restored, and for every shade S the S-produced experiences have (in normal circumstances) the intentional content of being-as-of-S. (Shoemaker 1996, 111)
6. The original quality space:

7. After the first partial inversion:

8. After the second and final partial inversion:

9. Ramsey sentence for the original:

There are B,R,O,Y,C,G such that
(for any x)(for any y)
[(Lxy iff ((Bx & Ry) or (Bx & Gy))) &
(Mxy iff ((Rx & Oy) or (Gx & Cy))) &
(Nxy iff ((Ox & Yy) or (Cx & Yy))) &
x is B if its stimulus is in Sb &
x is R if its stimulus is in Sr &
x is O if its stimulus is in So &
x is Y if its stimulus is in Sy &
x is C if its stimulus is in Sc &
x is G if its stimulus is in Sg ]

10. Ramsey sentence after the first inversion:

There are B,R,O,Y,C,G such that
(for any x)(for any y)
[(Lxy iff ((Bx & Ry) or (Bx & Gy))) &
(Mxy iff ((Rx & Oy) or (Gx & Cy))) &
(Nxy iff ((Ox & Yy) or (Cx & Yy))) &
x is B if its stimulus is in Sb &
x is R if its stimulus is in Sg &
x is O if its stimulus is in So &
x is Y if its stimulus is in Sy &
x is C if its stimulus is in Sc &
x is G if its stimulus is in Sr ]

Their quality spaces are alike with the following exception. Jill sees a certain shade of green, call it G, as standing in the similarity relations to other shades that Jack sees a certain shade of red, call it R, as standing in, and sees R as standing in the similarity relations that Jack sees G as standing in. (Shoemaker 1996, 109)

11. Ramsey sentence after the final inversion:

There are B,R,O,Y,C,G such that
(for any x)(for any y)
[(Lxy iff ((Bx & Ry) or (Bx & Gy))) &
(Mxy iff ((Rx & Oy) or (Gx & Cy))) &
(Nxy iff ((Ox & Yy) or (Cx & Yy))) &
x is B if its stimulus is in Sb &
x is R if its stimulus is in So &
x is O if its stimulus is in Sc &
x is Y if its stimulus is in Sy &
x is C if its stimulus is in Sg &
x is G if its stimulus is in Sr ]
12. After the second and final partial inversion:

13. The original space, flipped vertically:

14. An intermediary claim:

If behaviorally undetectable spectrum inversion is a possibility, then different color qualia may be in a certain sense functionally indistinguishable. They will occupy different locations in a "space" of qualia, but because of the symmetrical nature of that space it will be impossible to give a functional description that applies to the one but not to the other--rather in the way that if one is describing in spatial terms a spatially symmetrical array of objects, then any description one gives of an object will apply as well to its symmetrical counterpart. If this is so, then color qualia will be "ineffable" in a way that goes beyond the irreducibility to particular physical properties that goes with multiple realizability. (Shoemaker 1996, 263)

15. Shoemaker's conclusion:

an adequate description of the case must invoke a notion of qualitative, or phenomenal, similarity that is distinct from (even if normally coextensive with) the relation of "intentional similarity", and with this it must invoke qualia in addition to intentional properties of experience. (Shoemaker 1996, 112)

16. Another statement of it:

The possibility of total spectrum inversion, if indeed it is possible, dramatizes the need to distinguish qualia, or phenomenal properties of experiences, from sense-individuated intentional properties of them. (Shoemaker 1996, 112)