

Spatio-temporal Symmetry - Point Groups with Time Translations

Supplementary Information - Stereographic Projections

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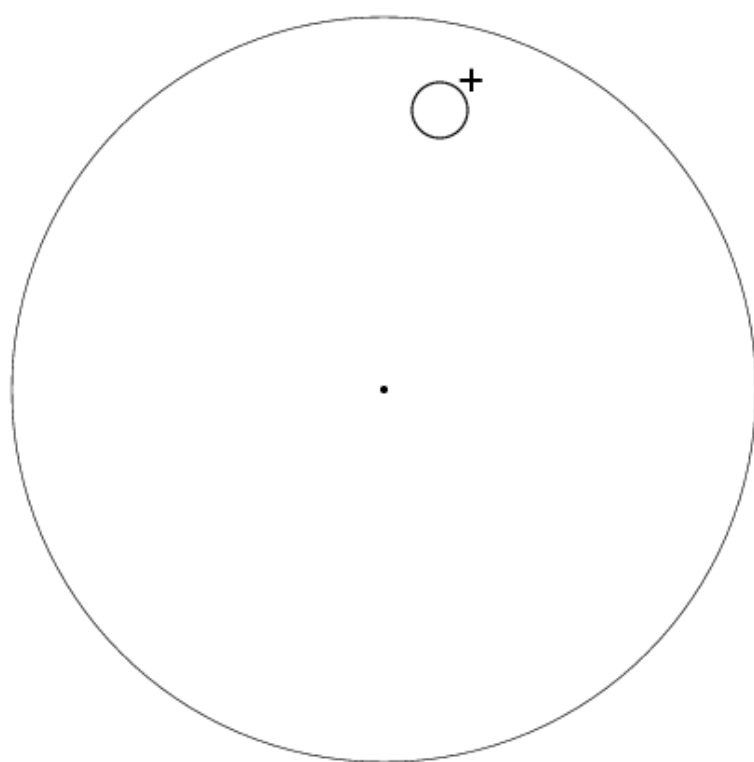
The stereographic projections of point groups with time-translations are listed below, ordered by serial number as defined in the main text. Time translations are indicated in the diagram in a manner similar to how spatial translations perpendicular to the plane are indicated in space-group diagrams. Non-zero time translations are visually indicated by numbers in blue. No number implies a time translation of zero. The spatial element associated with a time translation is identified within the plane by proximity, and out of the plane using the superscript. Each figure has the spatio-temporal group index on the top-left, the normal subgroup of the spatio-temporal group with vanishing time translations on the top-center, and the corresponding point group on the top-right.

Anticlockwise is positive for axial rotations in all figures. For the point groups with three-fold and six-fold axial symmetry, the following convention is used - the axis '1' is chosen to be along the in-plane horizontal direction, and the axis 'x' makes an angle of $-\pi/6$ with respect to it. The sets of axes 1, 2, and 3, and x, y, and xy are each generated by threefold rotations about the out-of-plane direction.

1.1.1

1

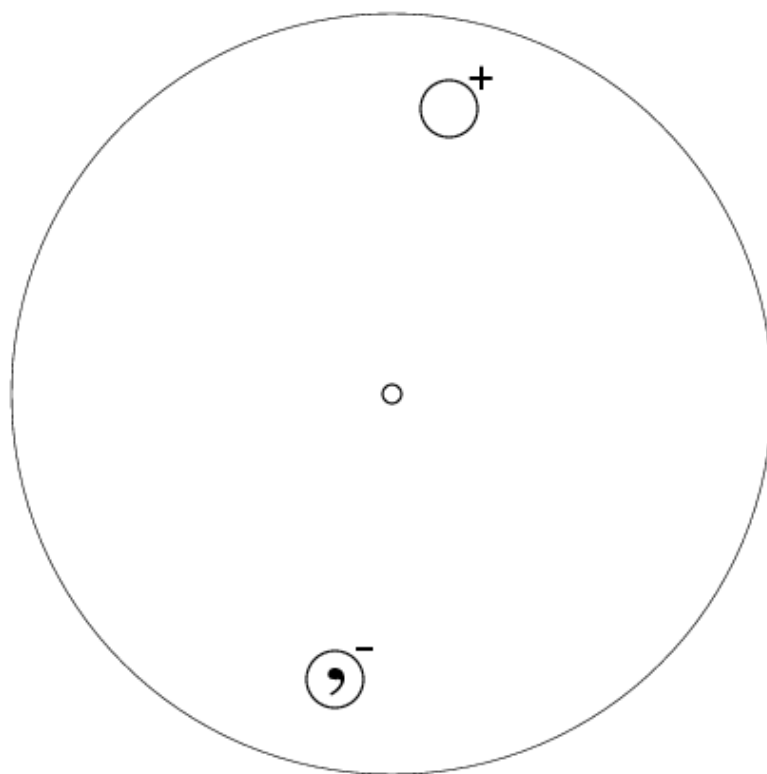
1



2.1.2

$\bar{1}$

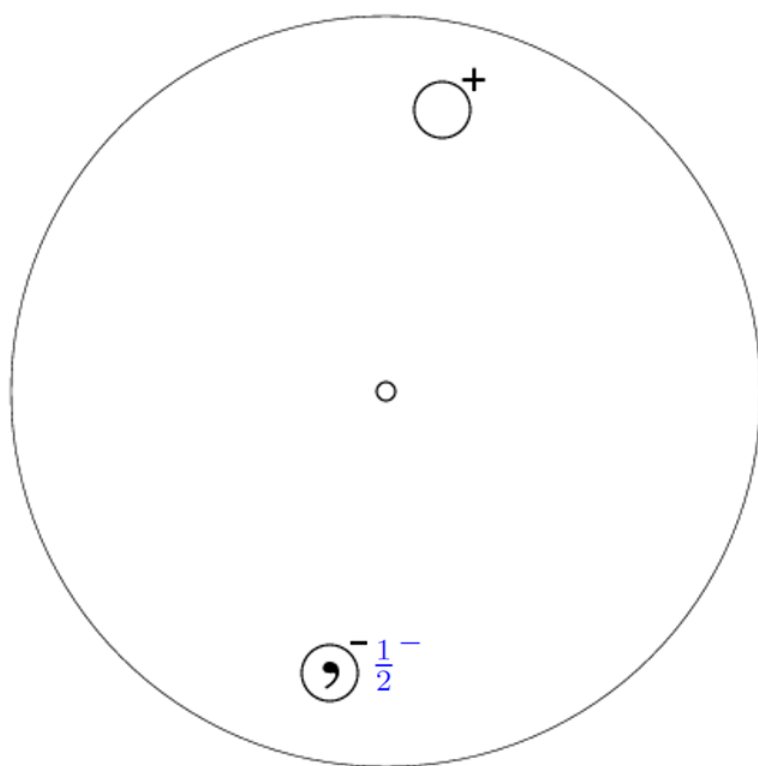
$\bar{1}$



2.2.3

1

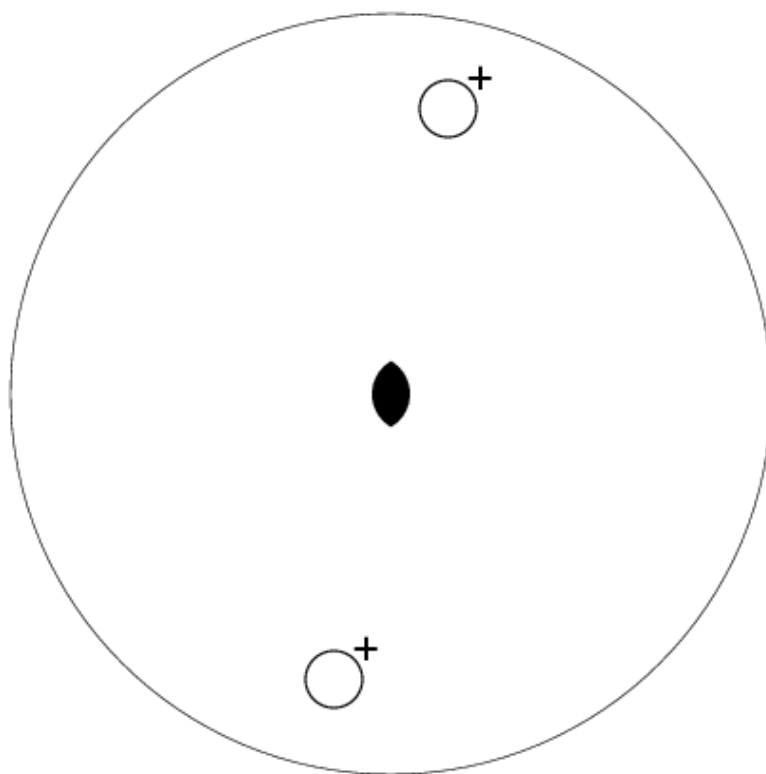
$\bar{1}$



3.1.4

2

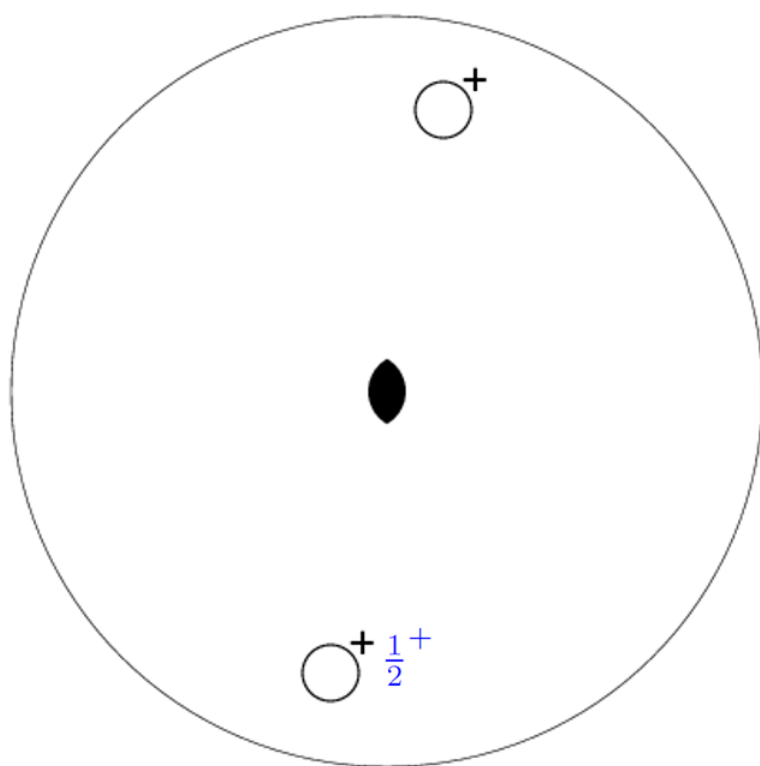
2



3.2.5

1

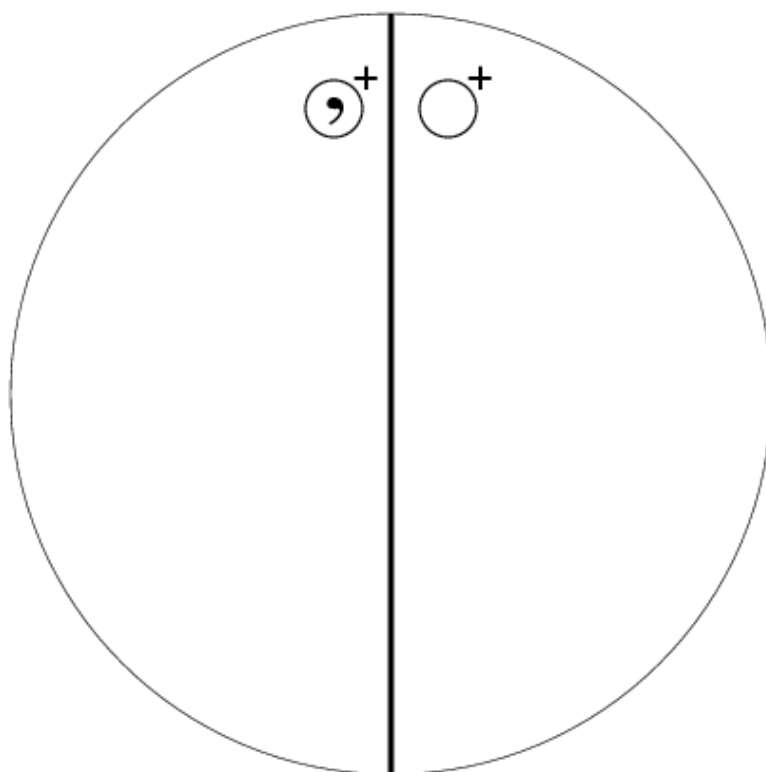
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4.1.6

m

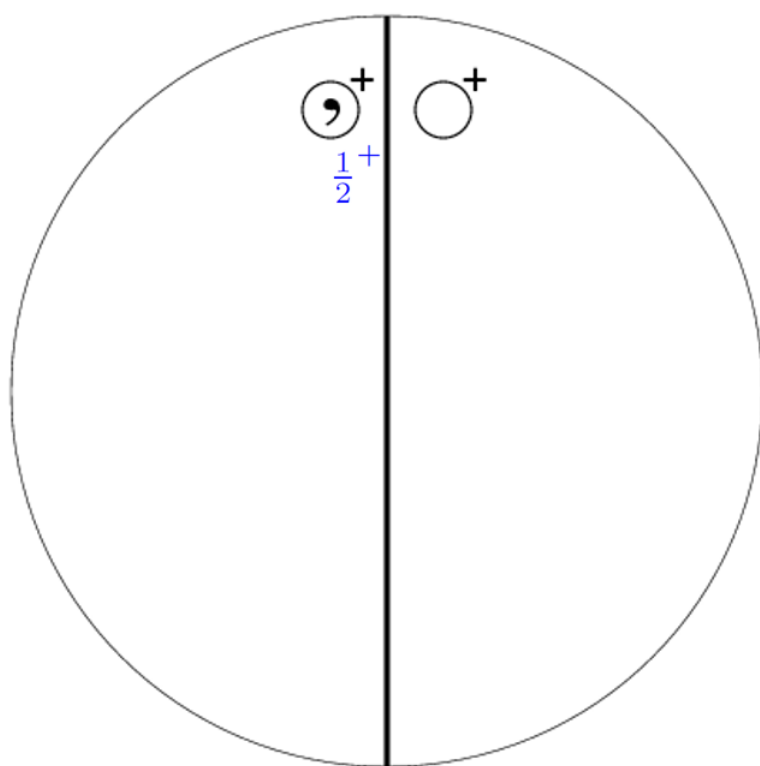
m



4.2.7

1

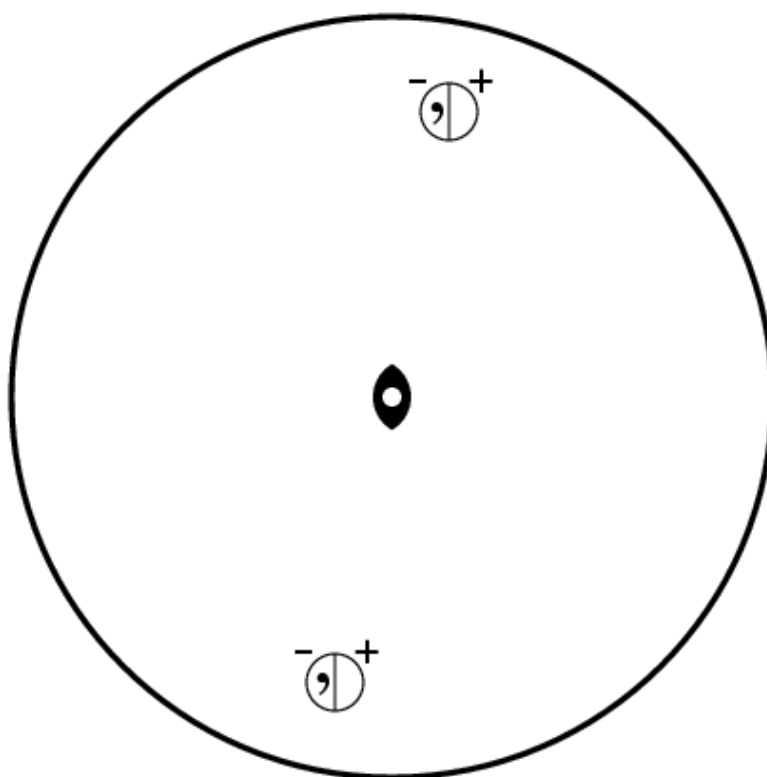
m



5.1.8

$2/m$

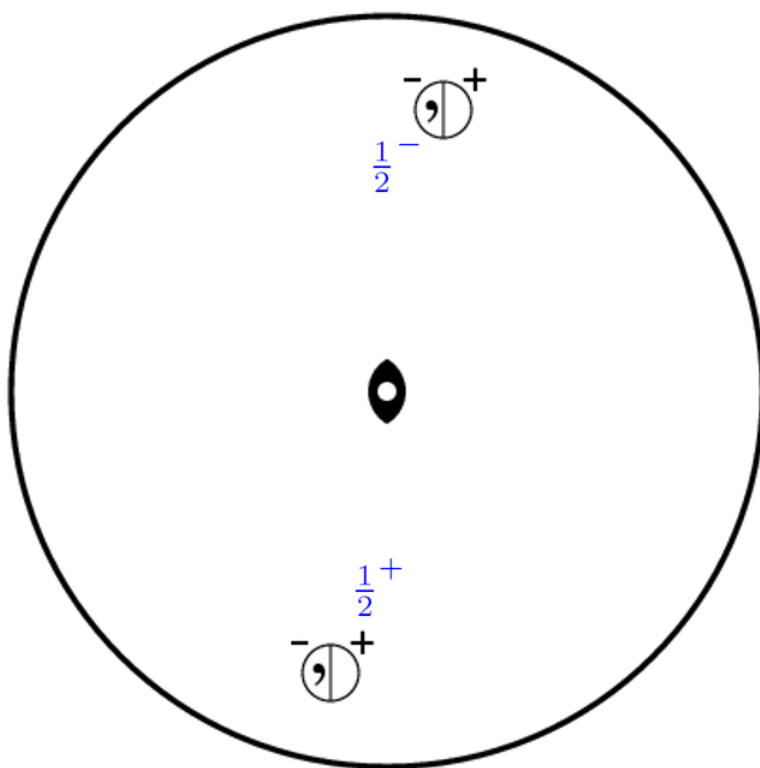
$2/m$



5.2.9

$\bar{1}$

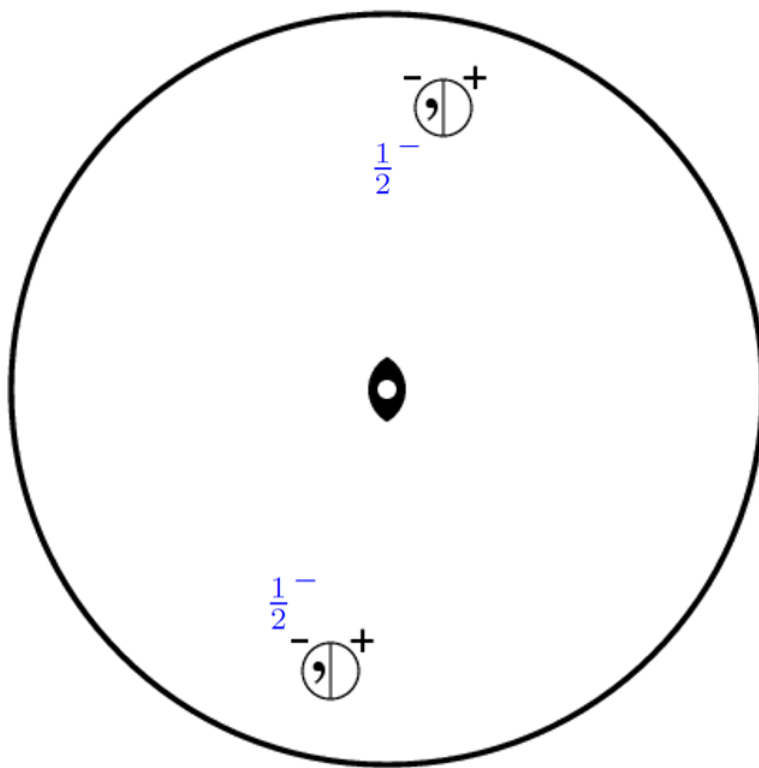
$2/m$



5.3.10

2

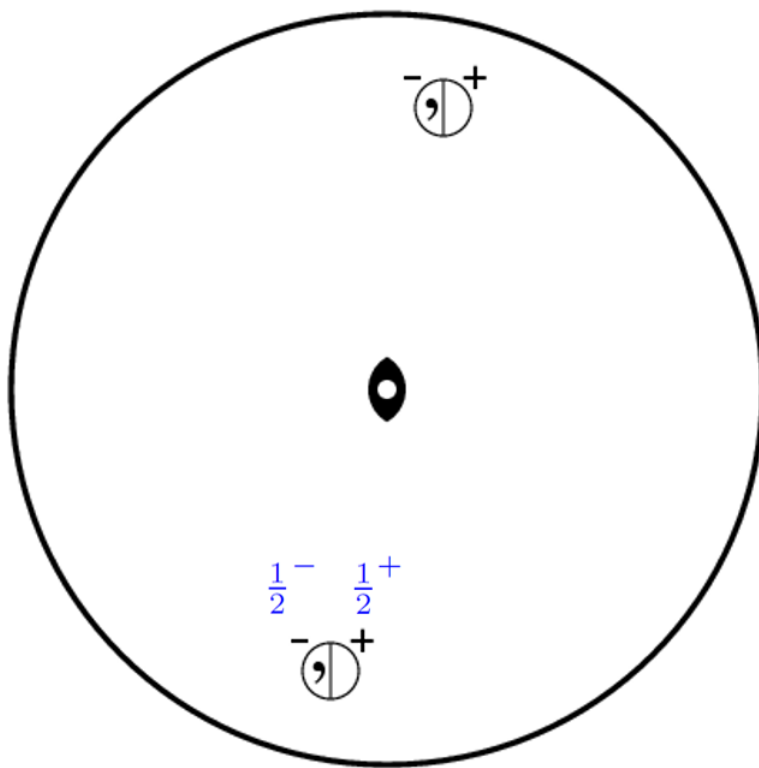
2/m



5.4.11

1

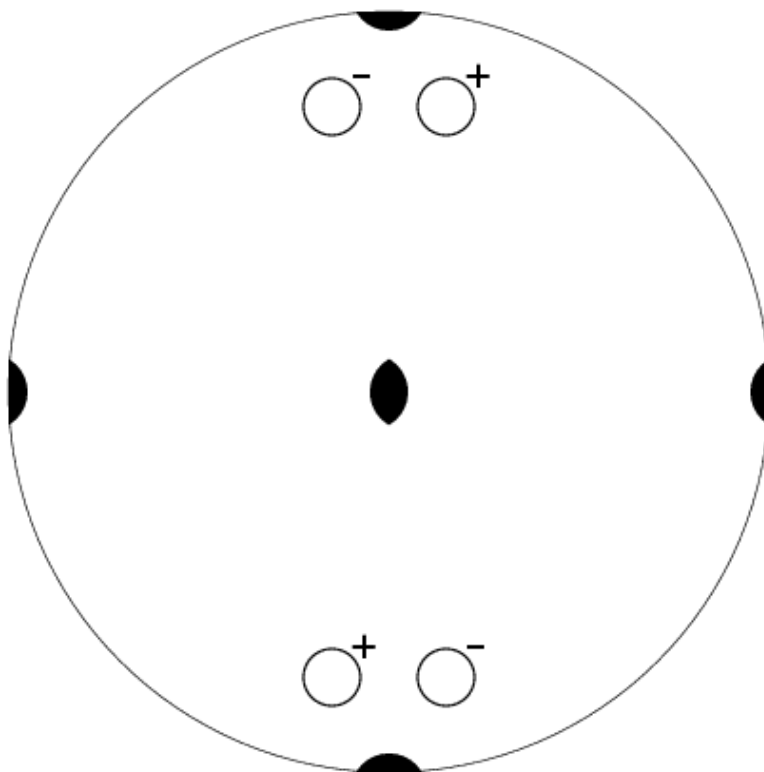
2/m



6.1.12

222

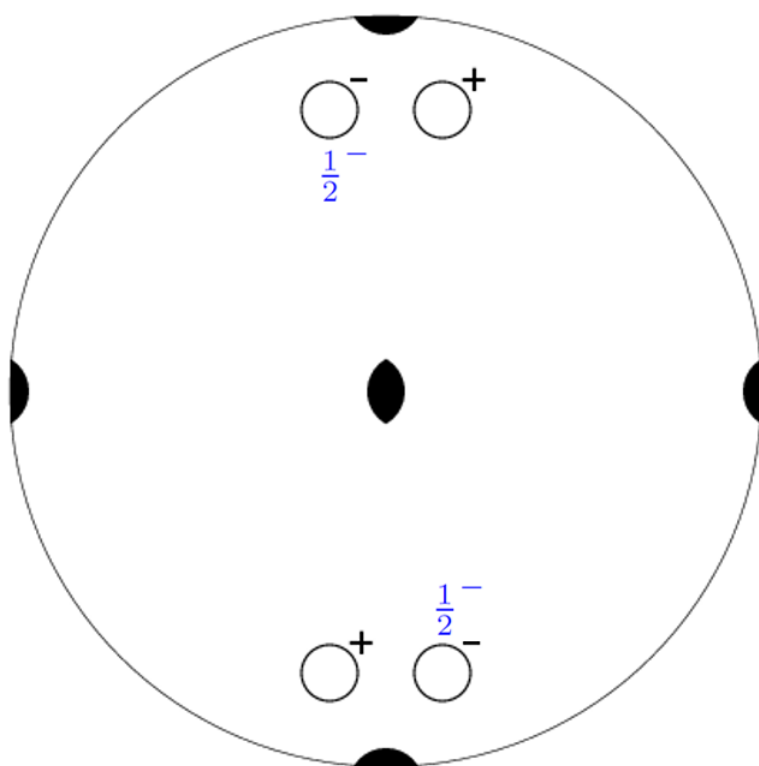
222



6.2.13

2

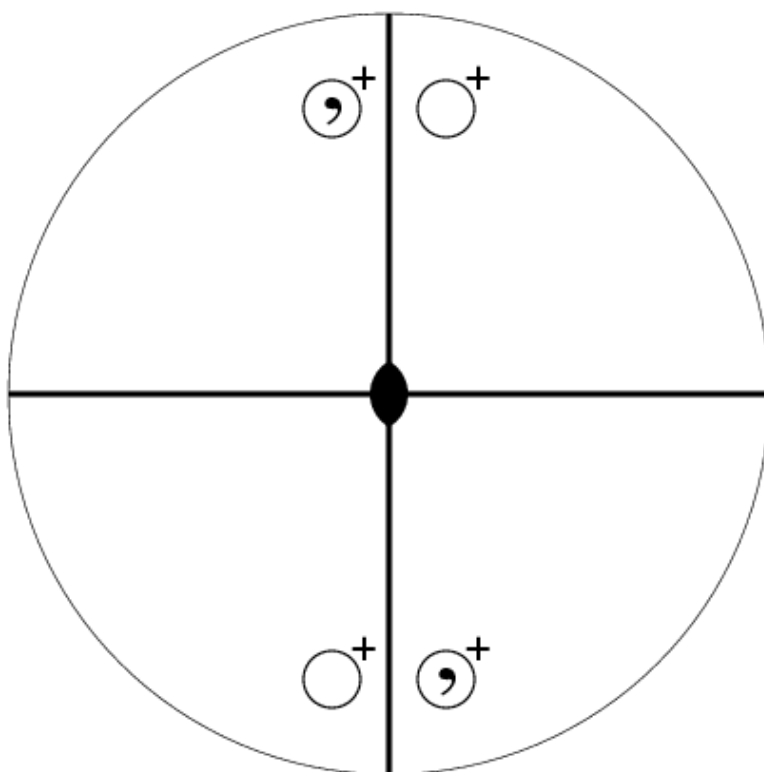
222



7.1.14

mm2

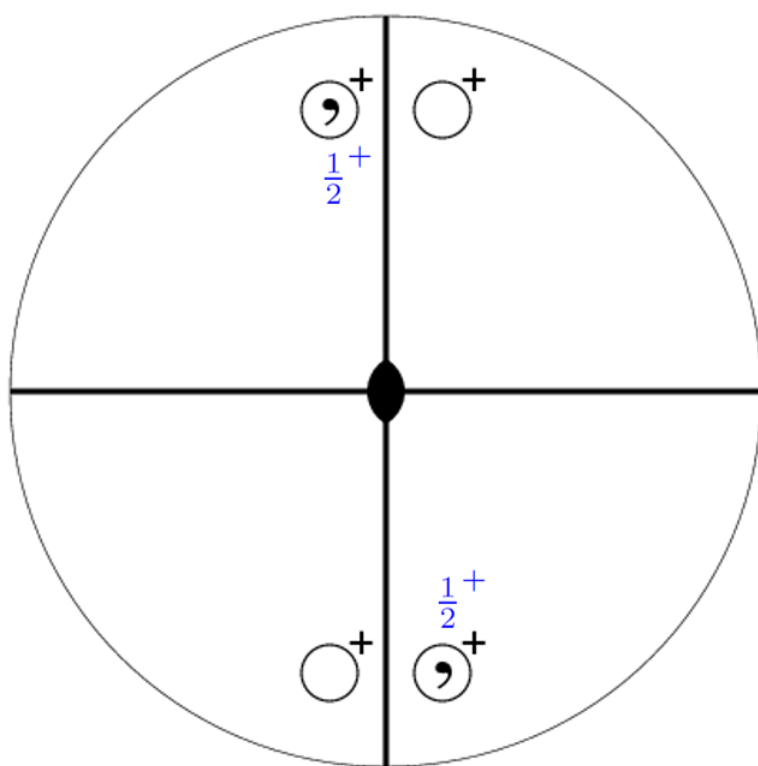
mm2



7.2.15

2

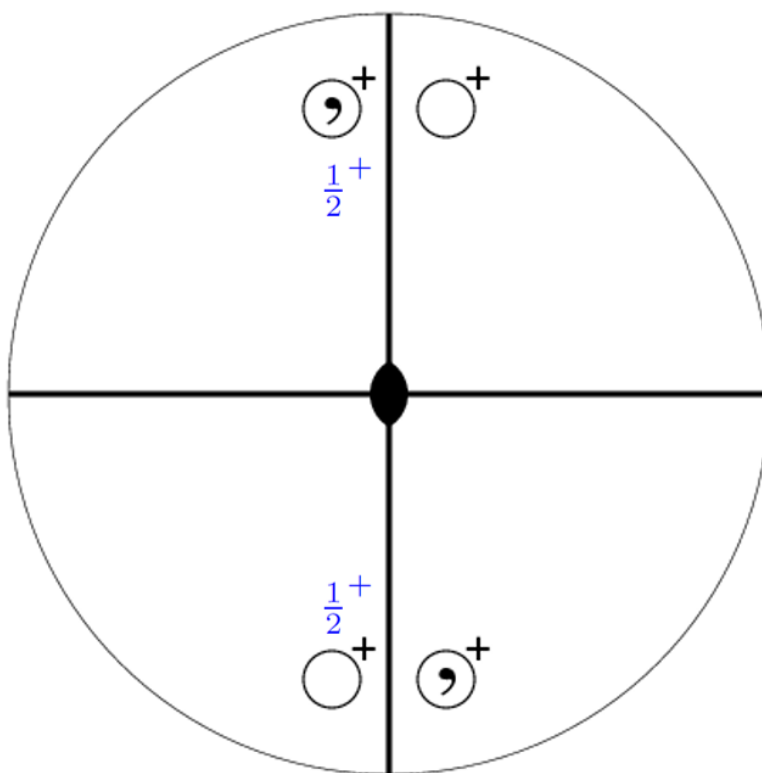
mm2



7.3.16

m

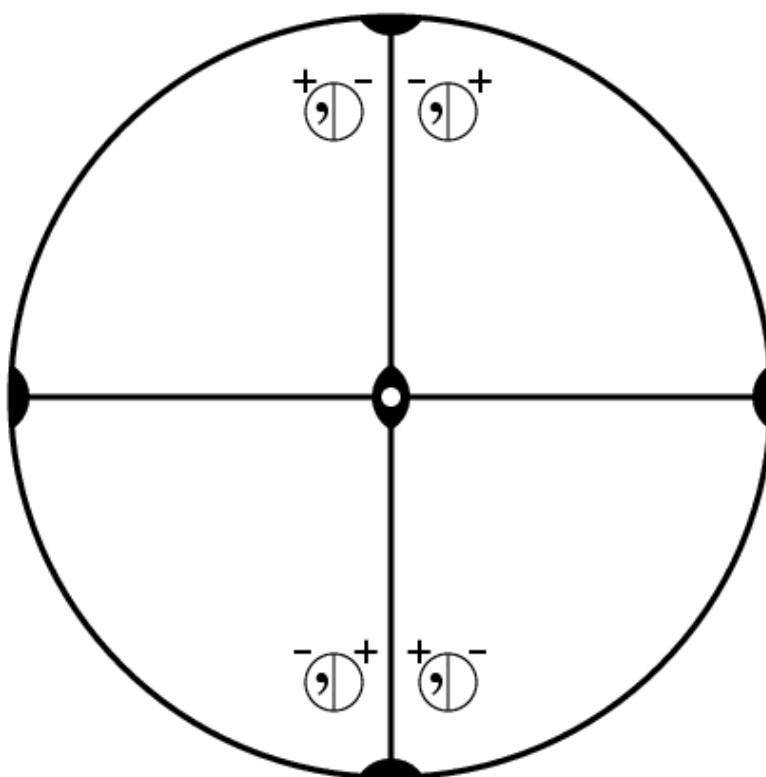
mm2



8.1.17

mmm

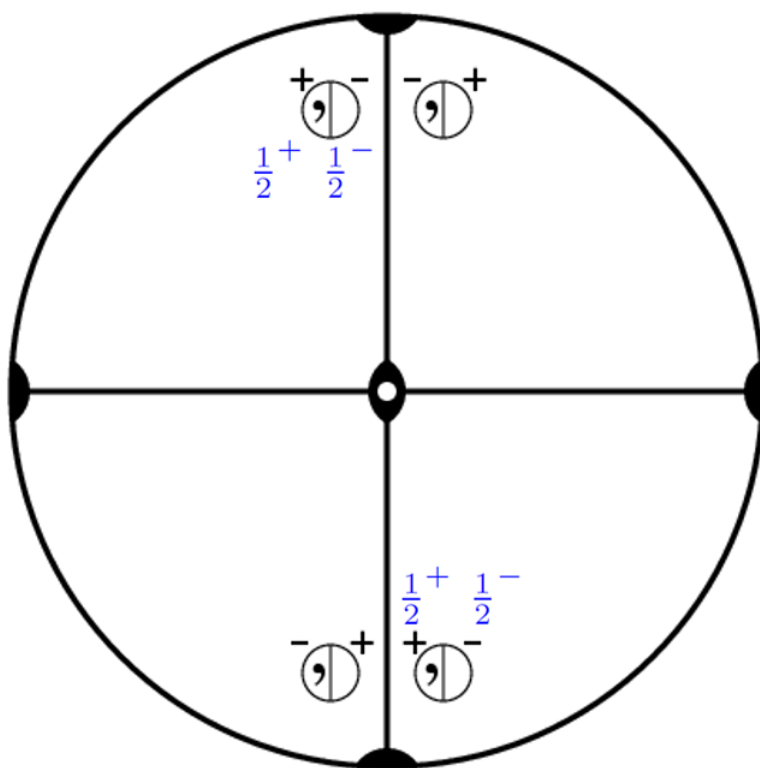
mmm



8.2.18

2/m

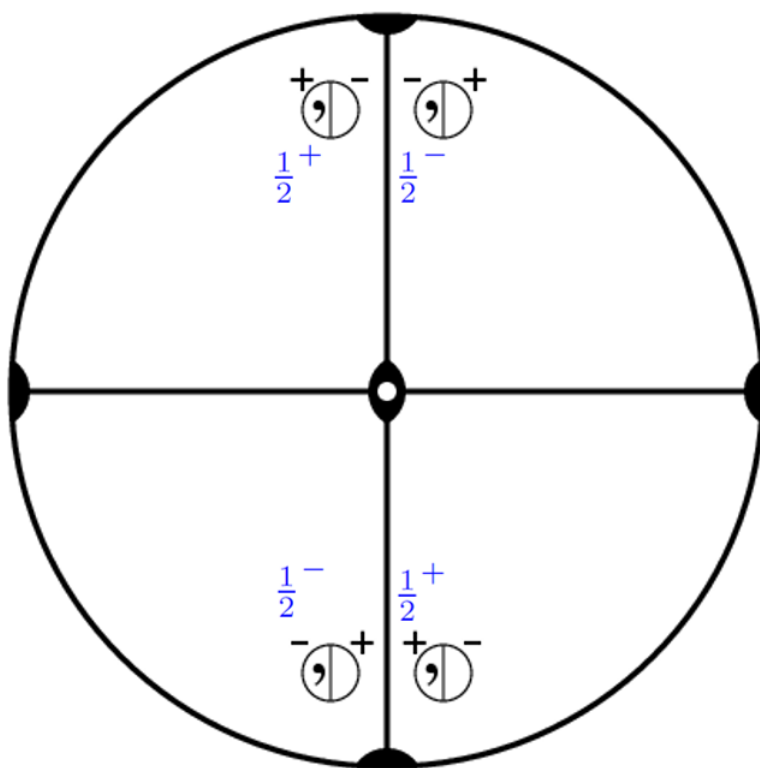
mmm



8.3.19

222

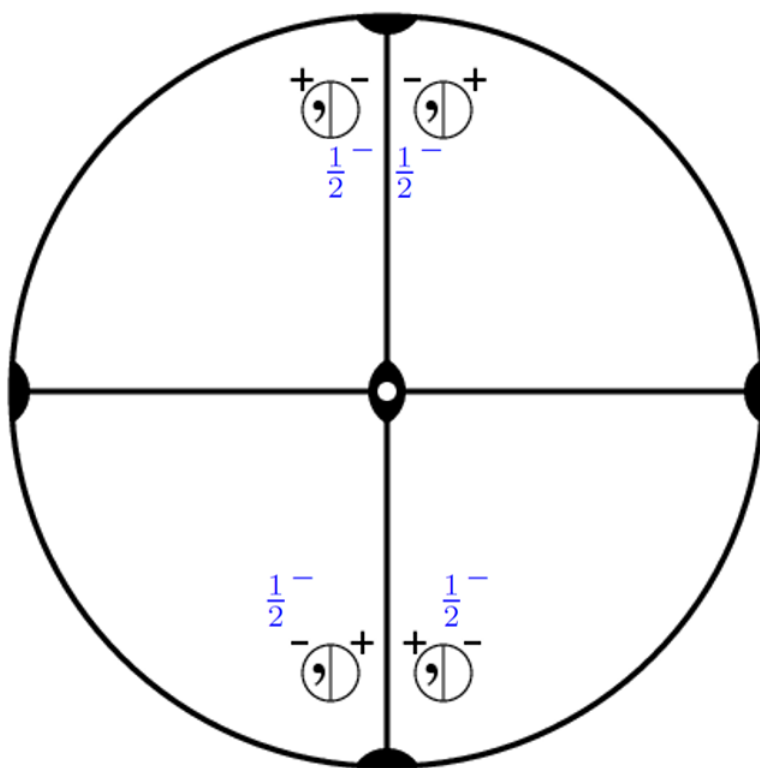
mmm



8.4.20

mm2

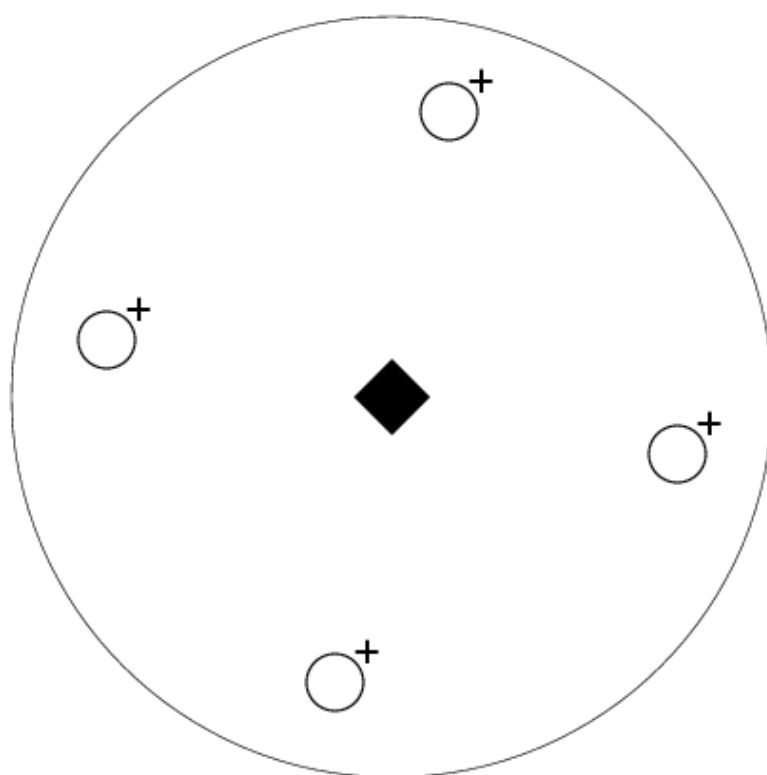
mmm



9.1.21

4

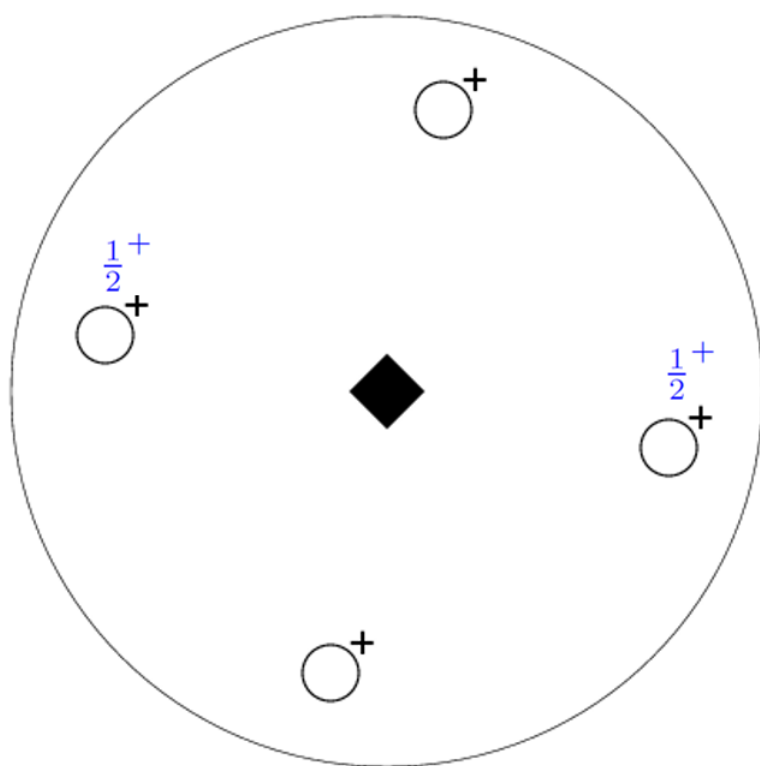
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9.2.22

2

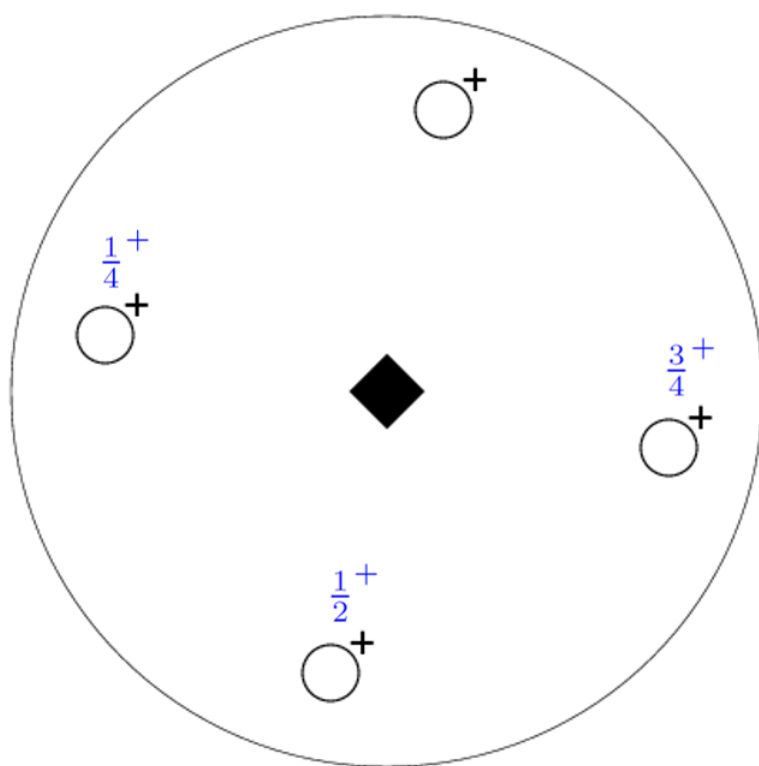
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9.3.23

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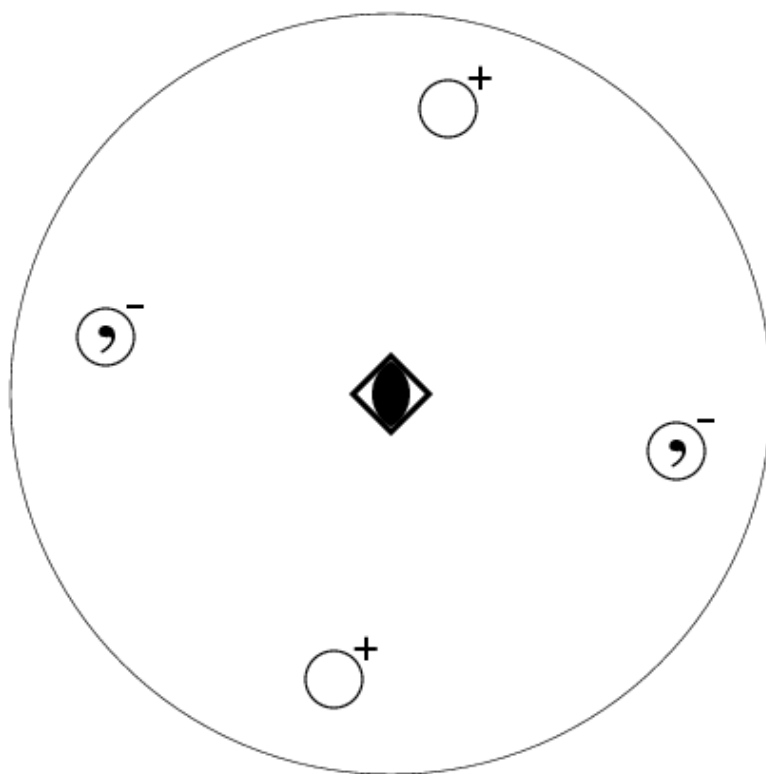
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10.1.24

$\bar{4}$

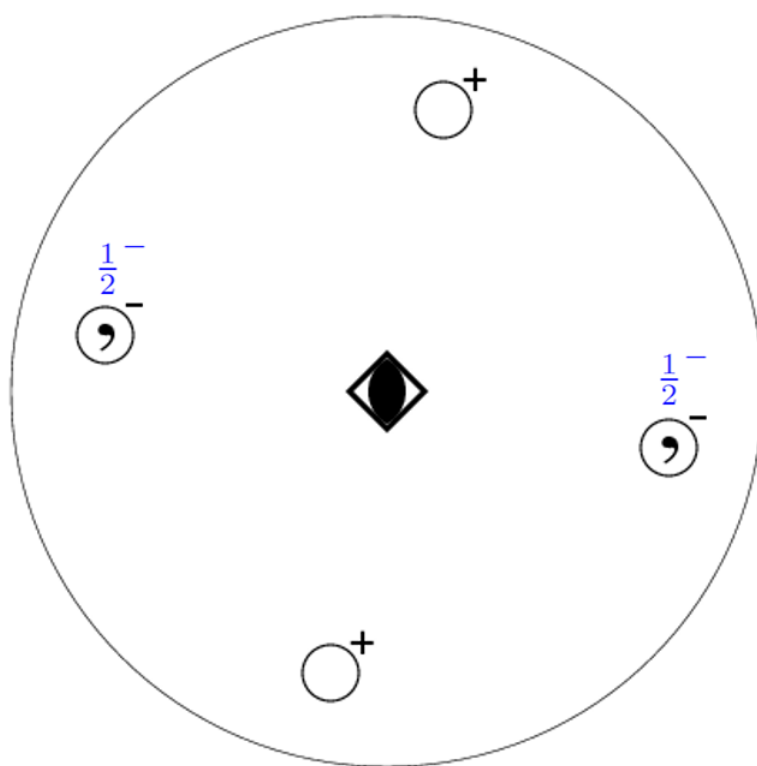
$\bar{4}$



10.2.25

2

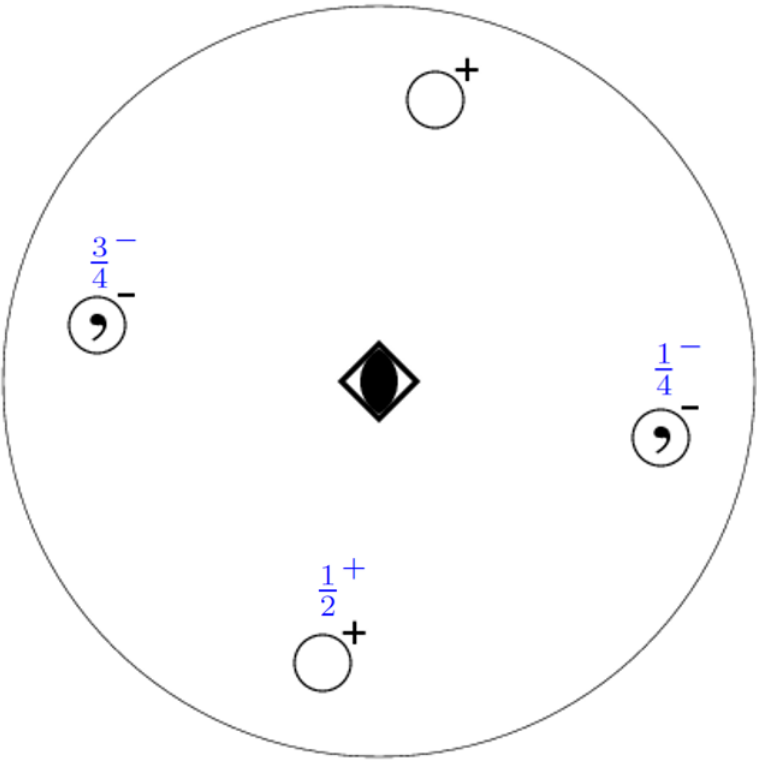
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10.3.26

1

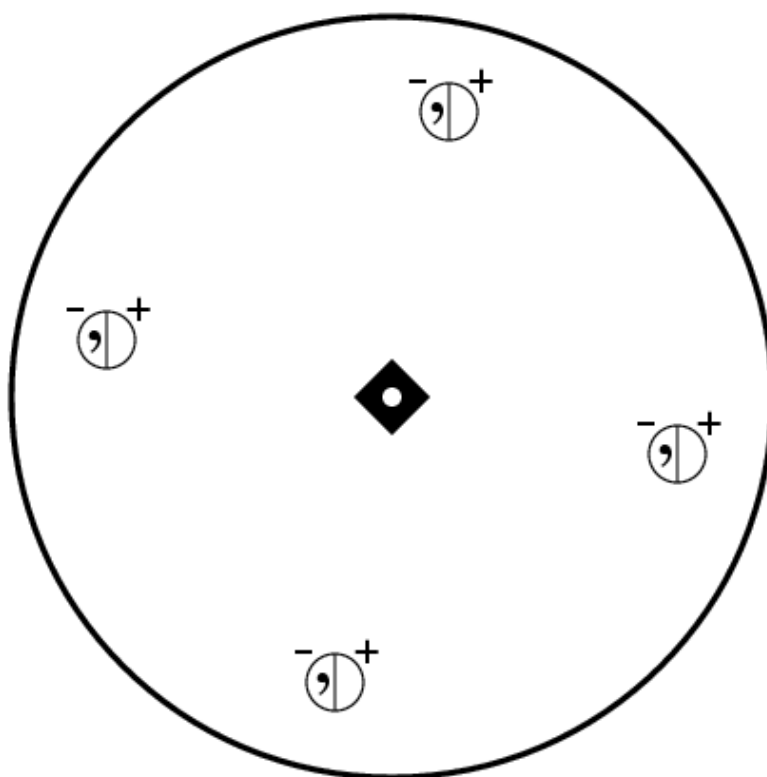
$\bar{4}$



11.1.27

4/m

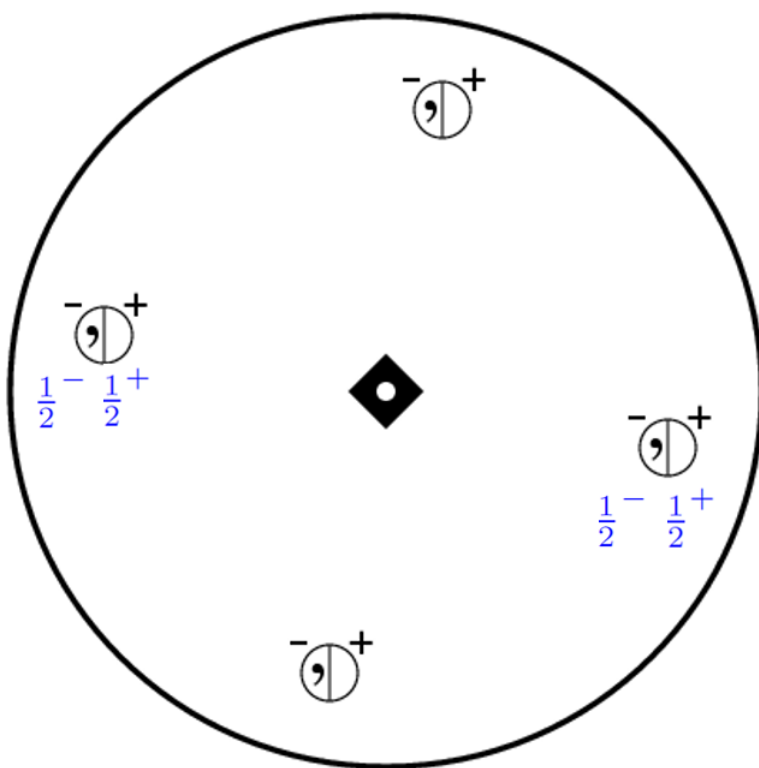
4/m



11.2.28

2/m

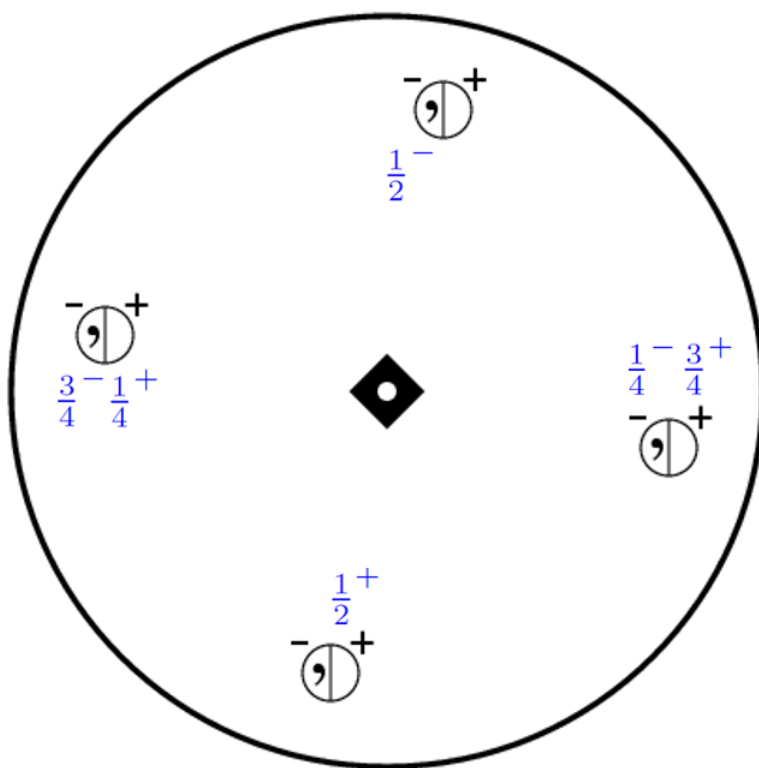
4/m



11.3.29

$\bar{1}$

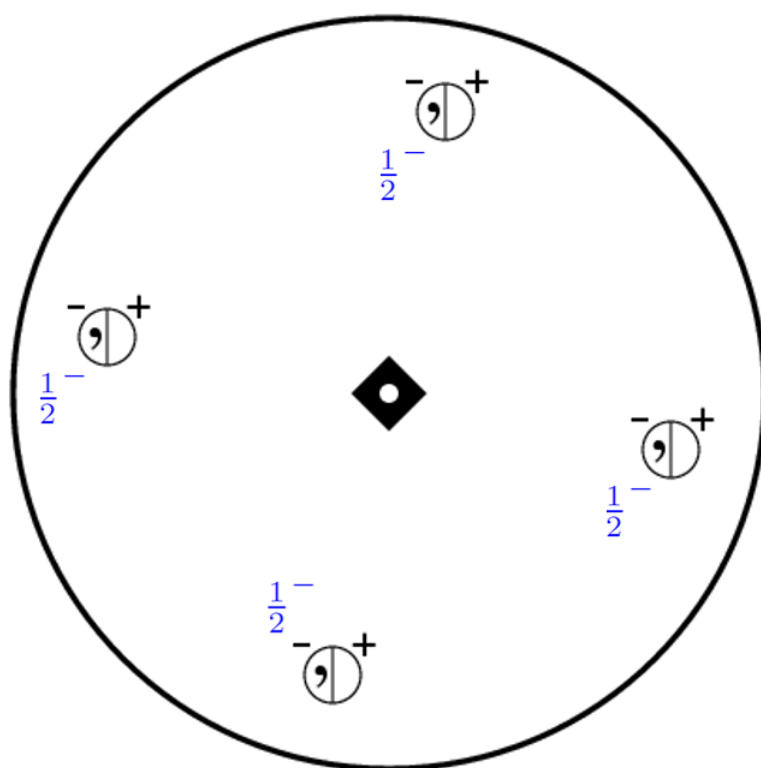
$4/m$



11.4.30

4

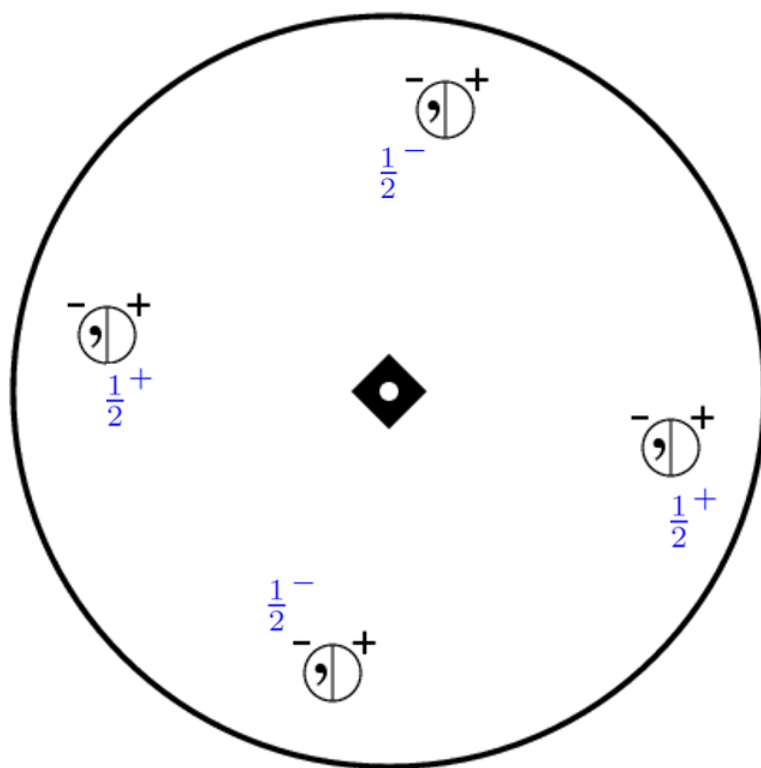
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11.5.31

$\bar{4}$

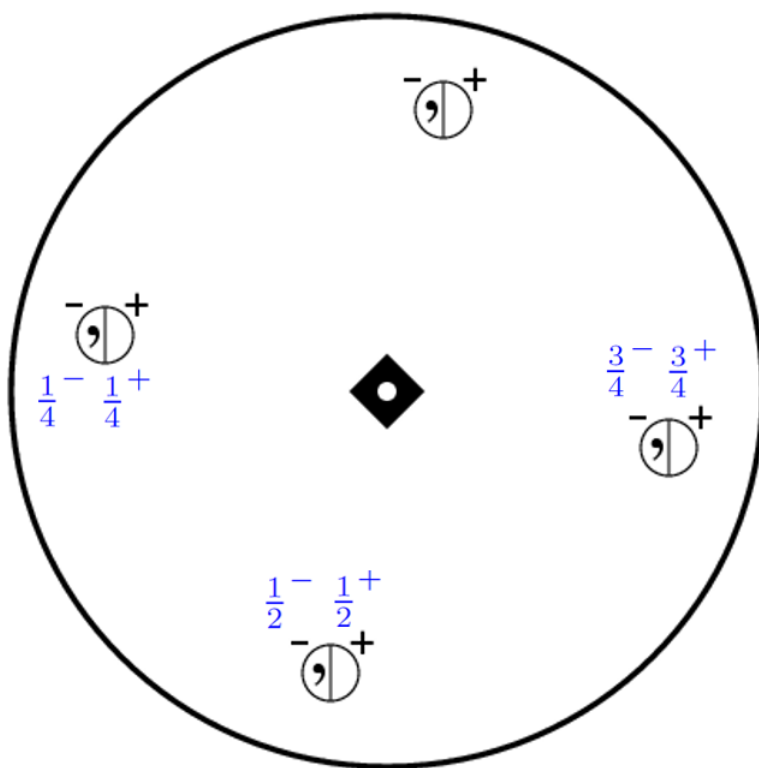
$4/m$



11.6.32

m

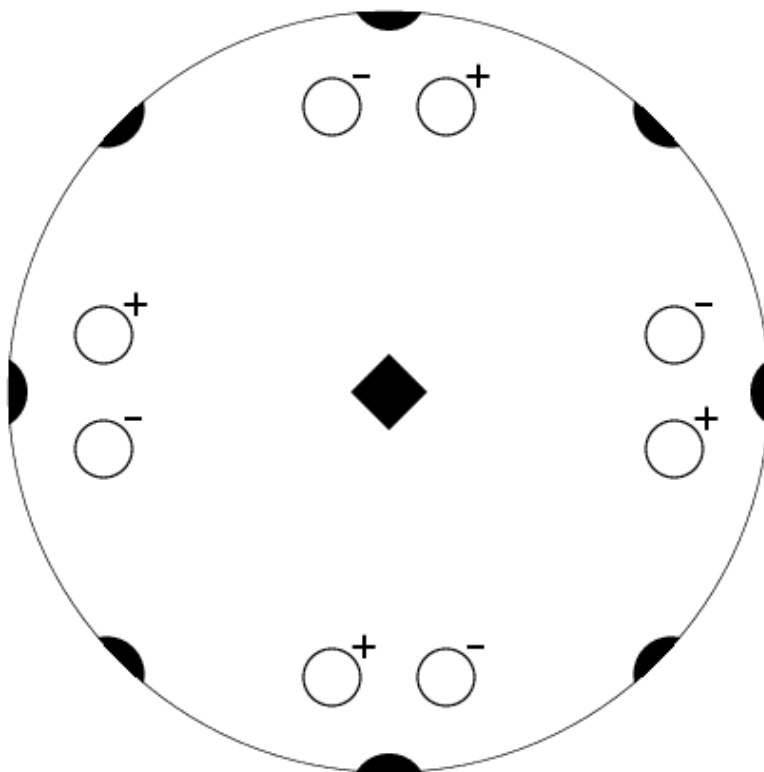
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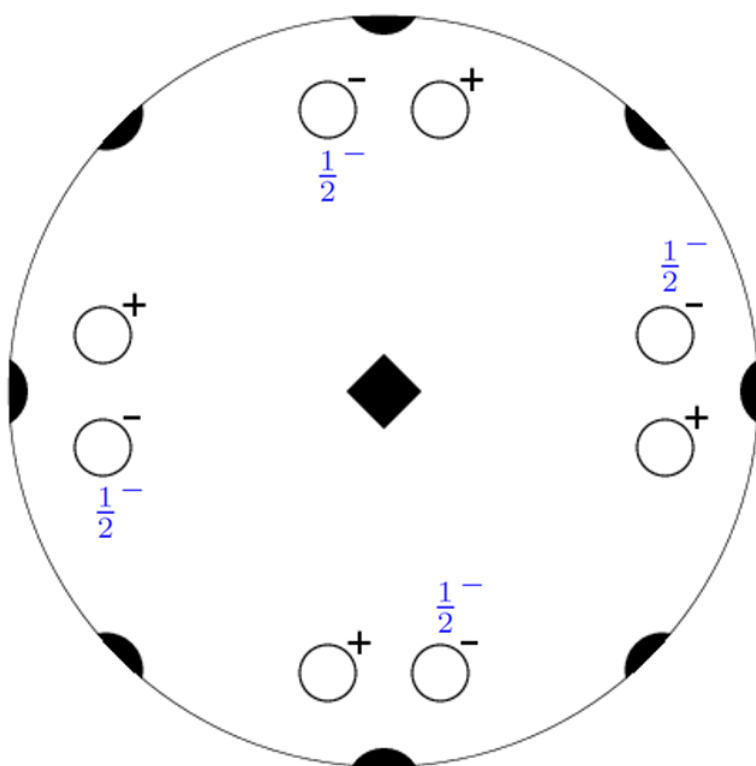


12.1.33

422

422

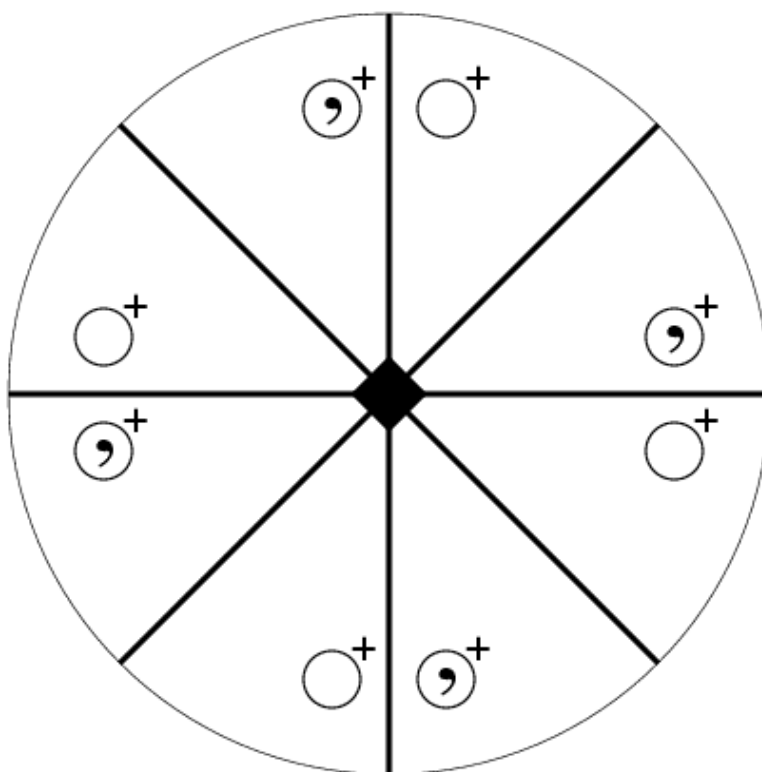




13.1.36

4mm

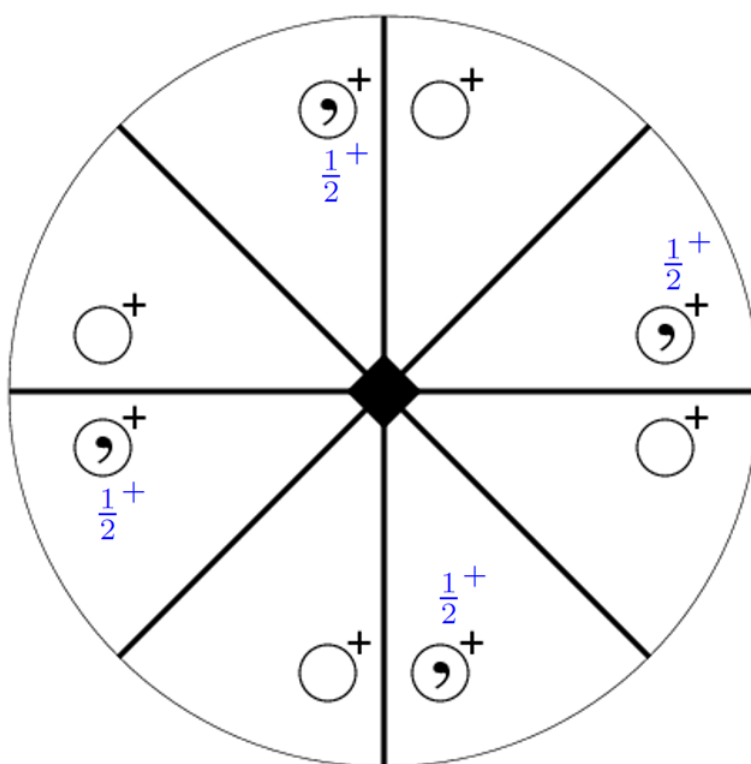
4mm



13.2.37

4

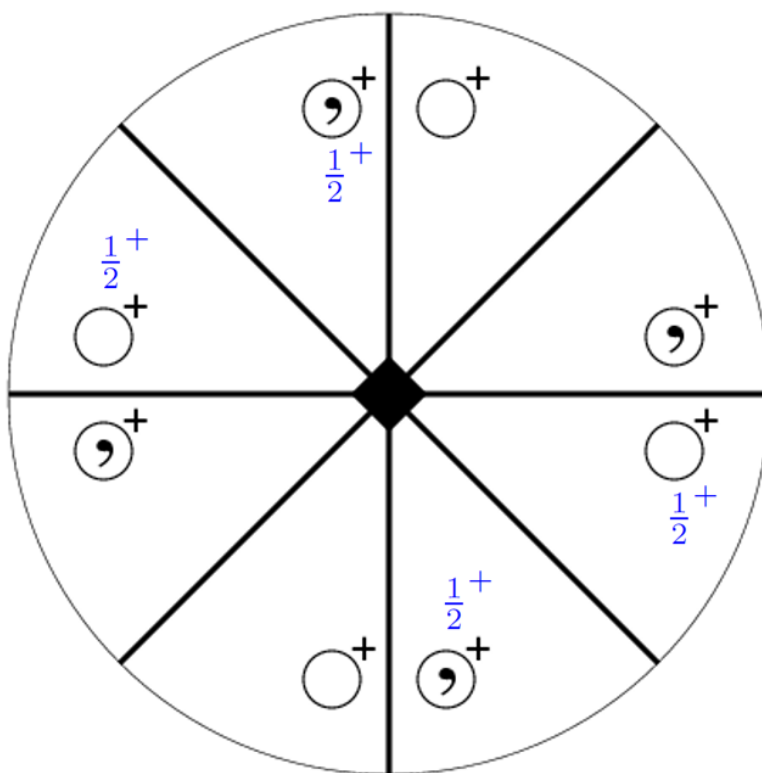
4mm



13.3.38

mm2

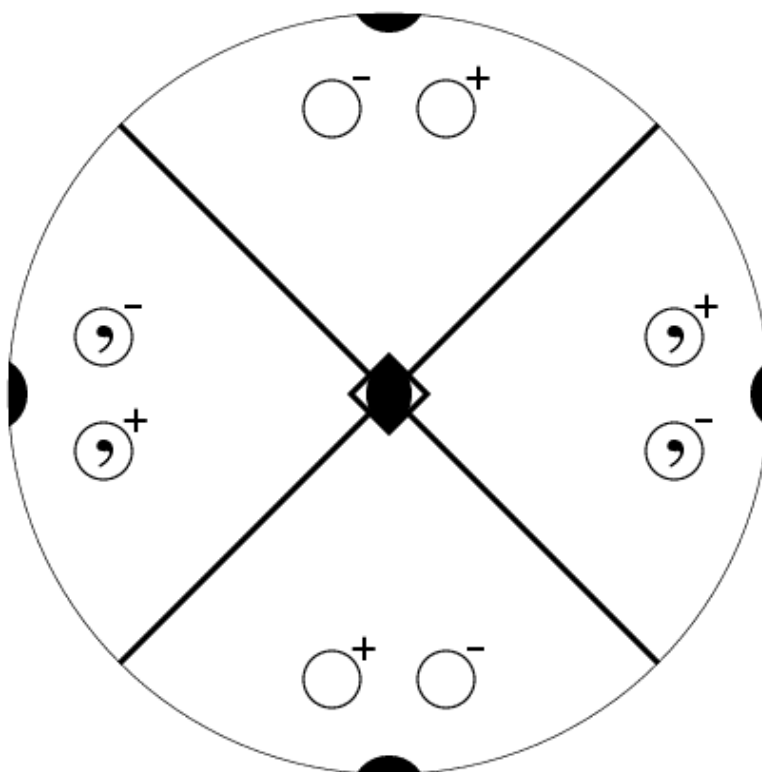
4mm



14.1.39

$\bar{4}2m$

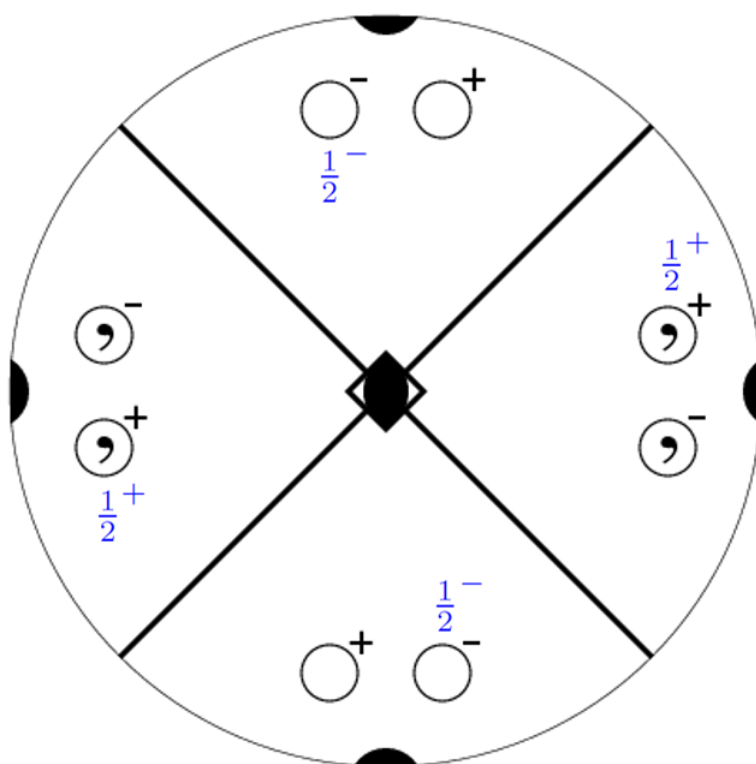
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14.2.40

$\bar{4}$

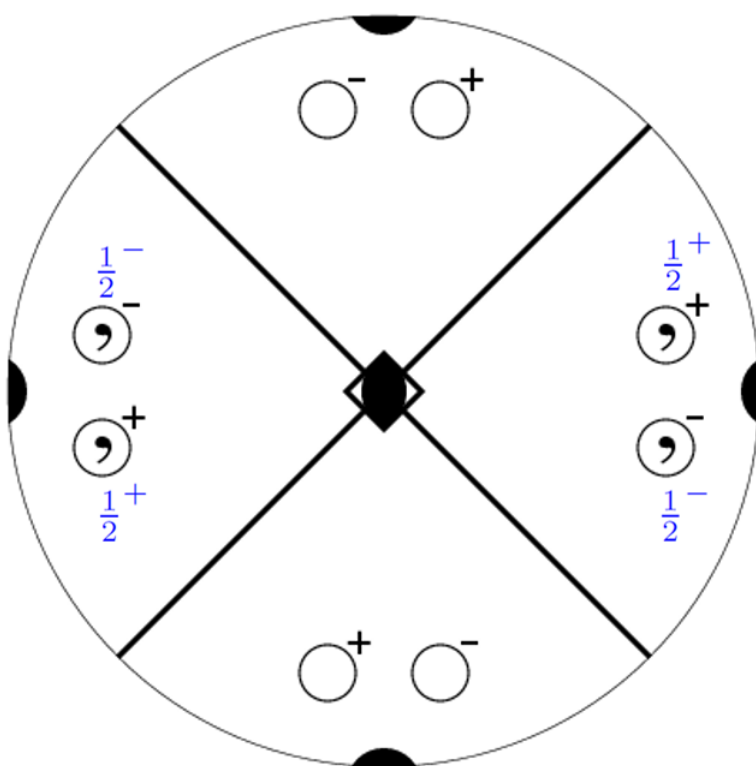
$\bar{4}2m$



14.3.41

222

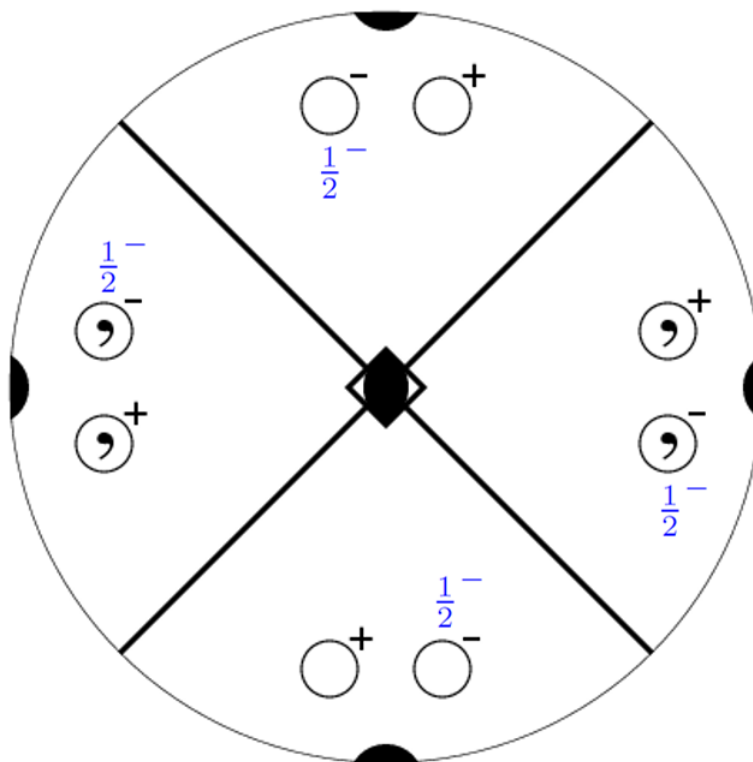
$\bar{4}2m$



14.4.42

mm2

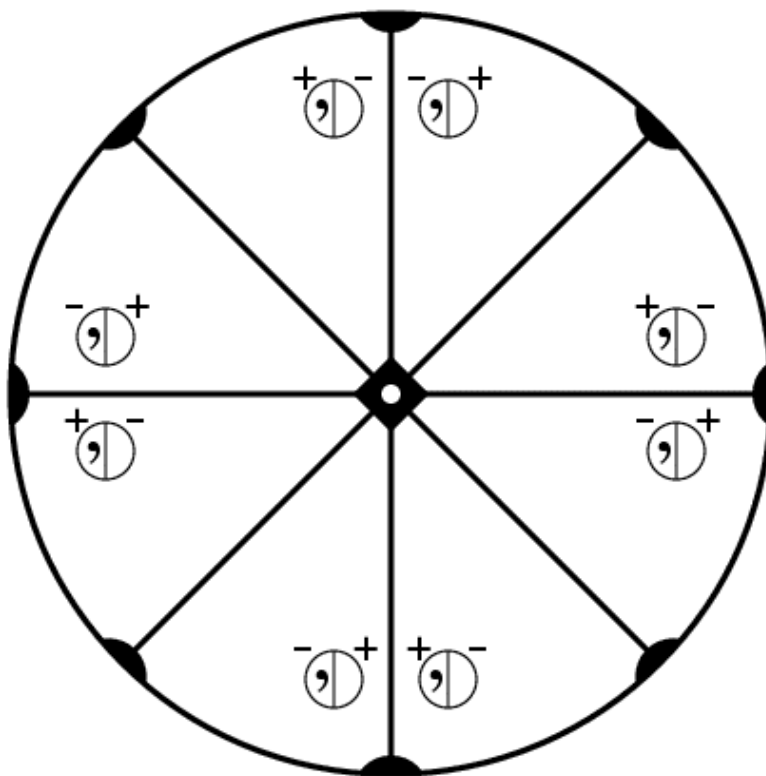
$\bar{4}2m$



15.1.43

$4/m\bar{m}m$

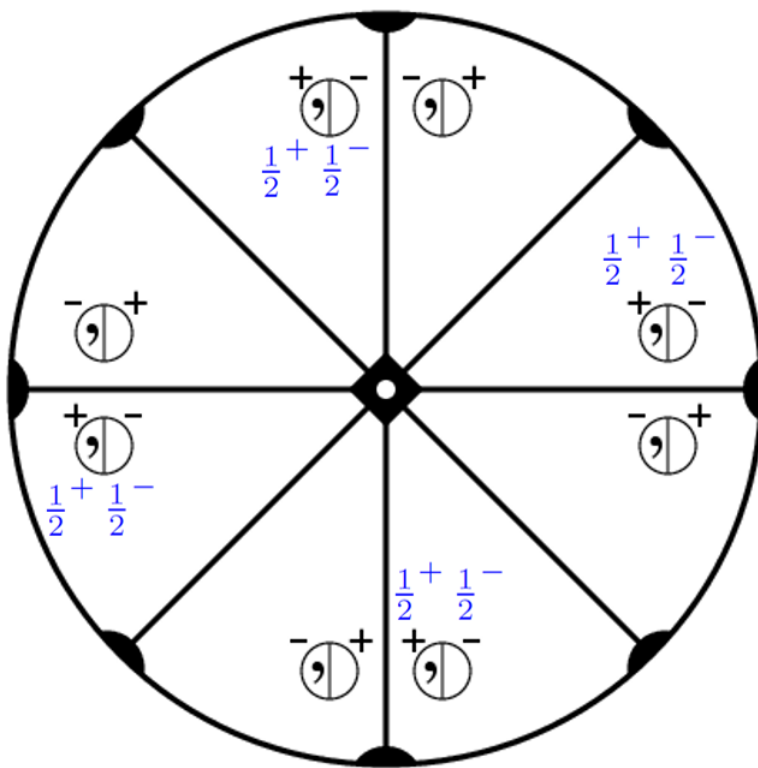
$4/m\bar{m}m$



15.2.44

$\bar{4}$

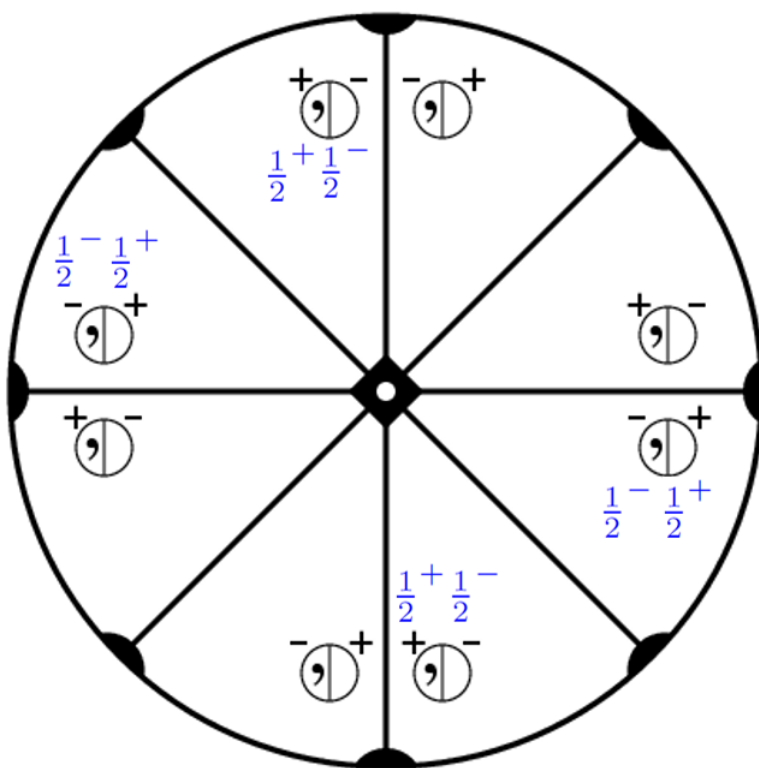
4/mmm



15.3.45

mmm

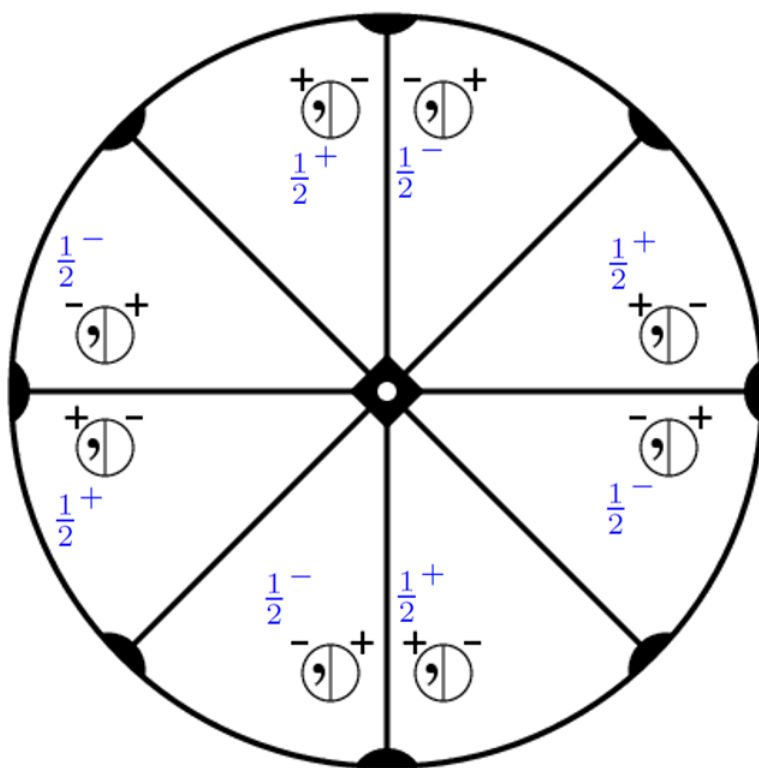
4/mmm



15.4.46

422

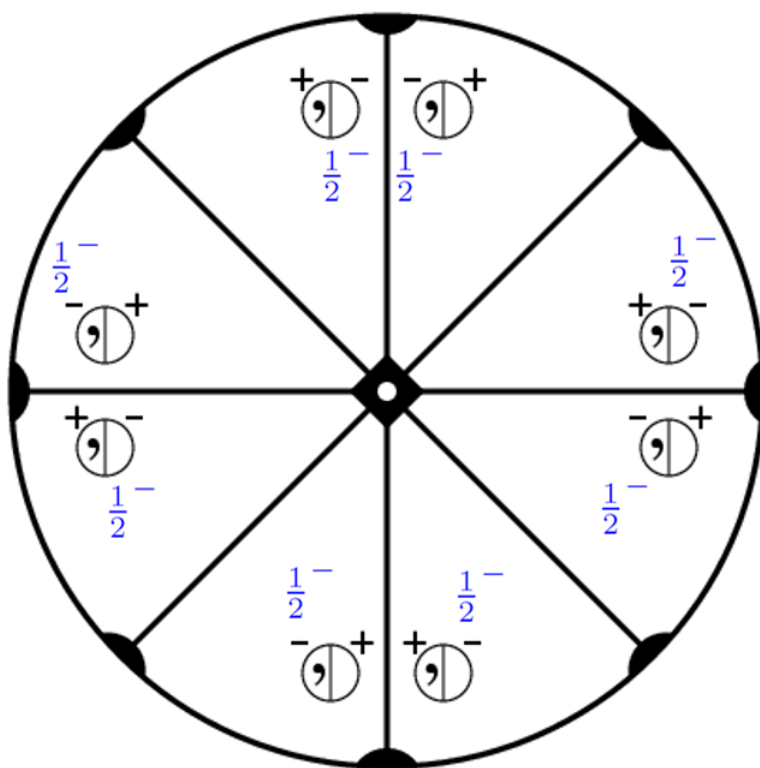
4/mmm



15.5.47

4mm

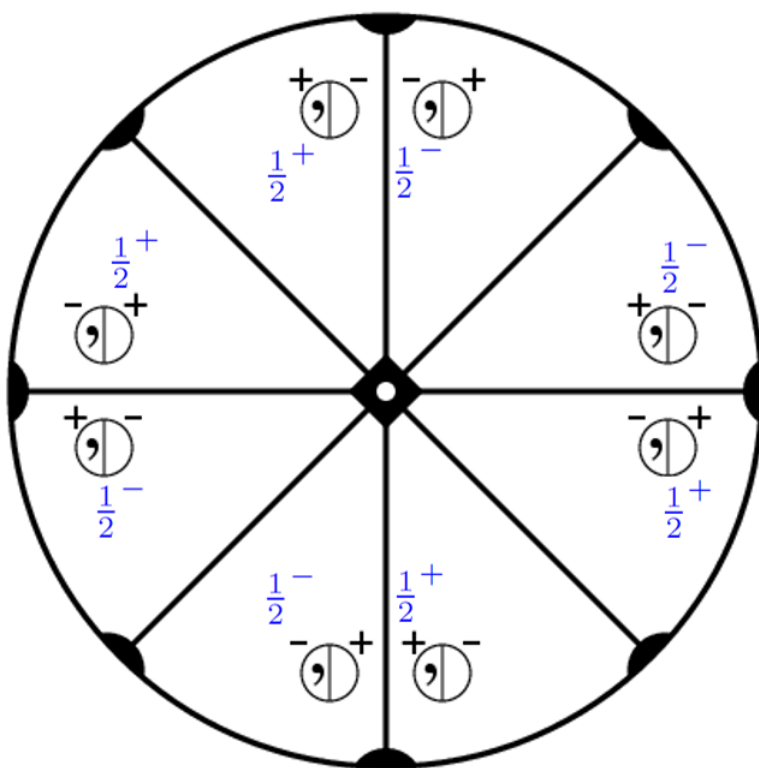
4/mmm



15.6.48

$\bar{4}2m$

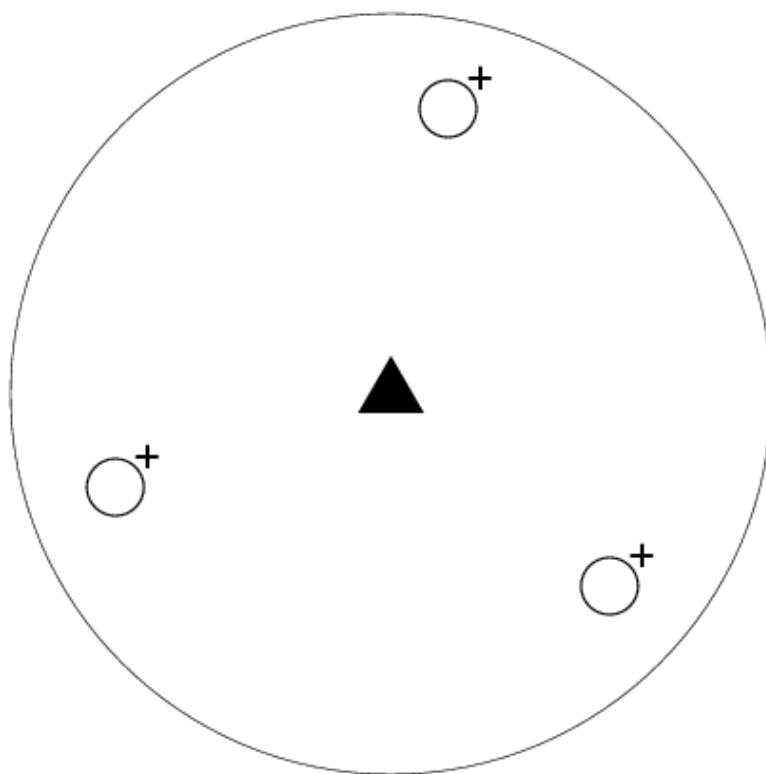
$4/m\bar{m}m$



16.1.49

3

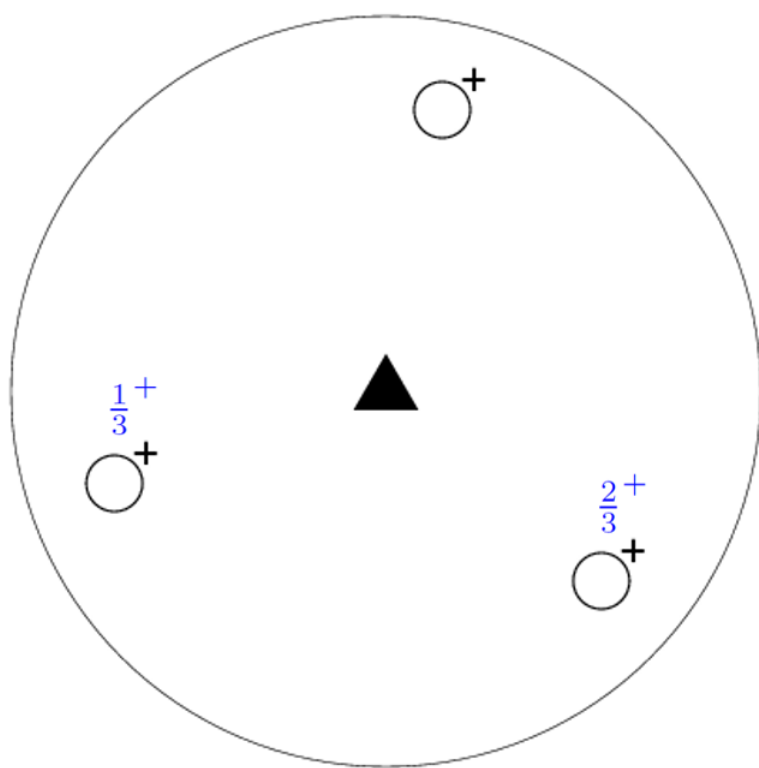
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16.2.50

1

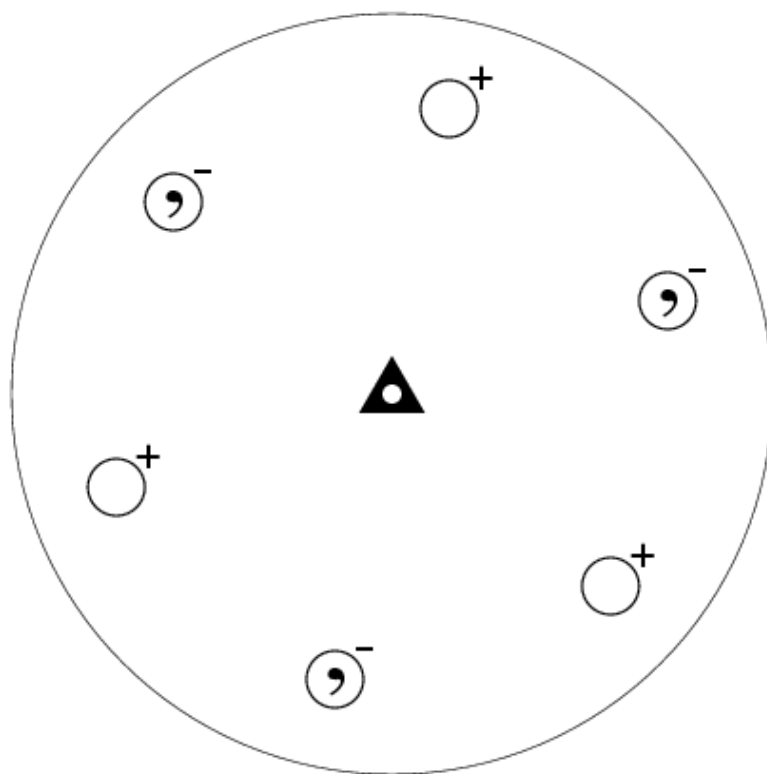
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17.1.51

$\bar{3}$

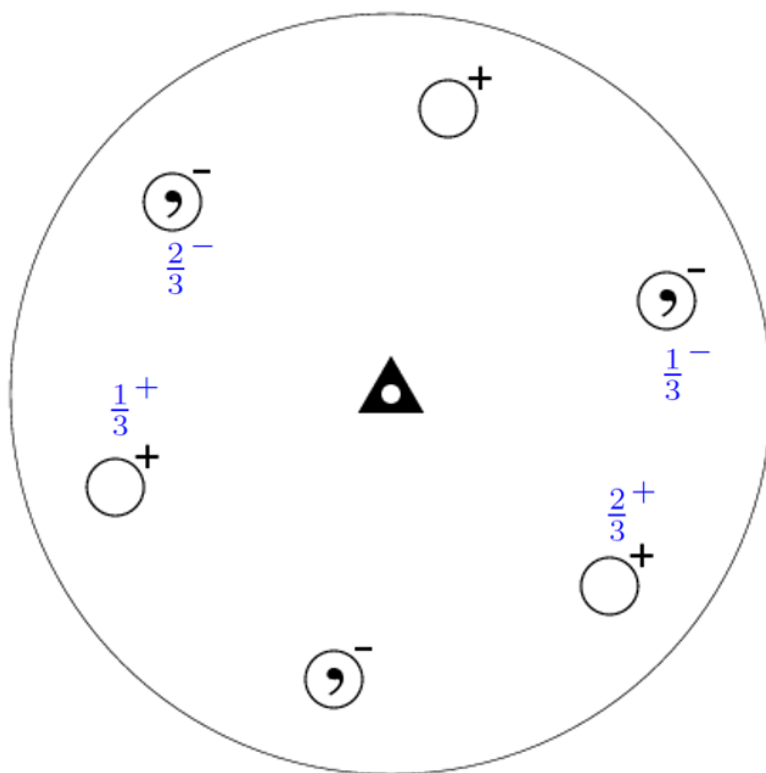
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17.2.52

$\bar{1}$

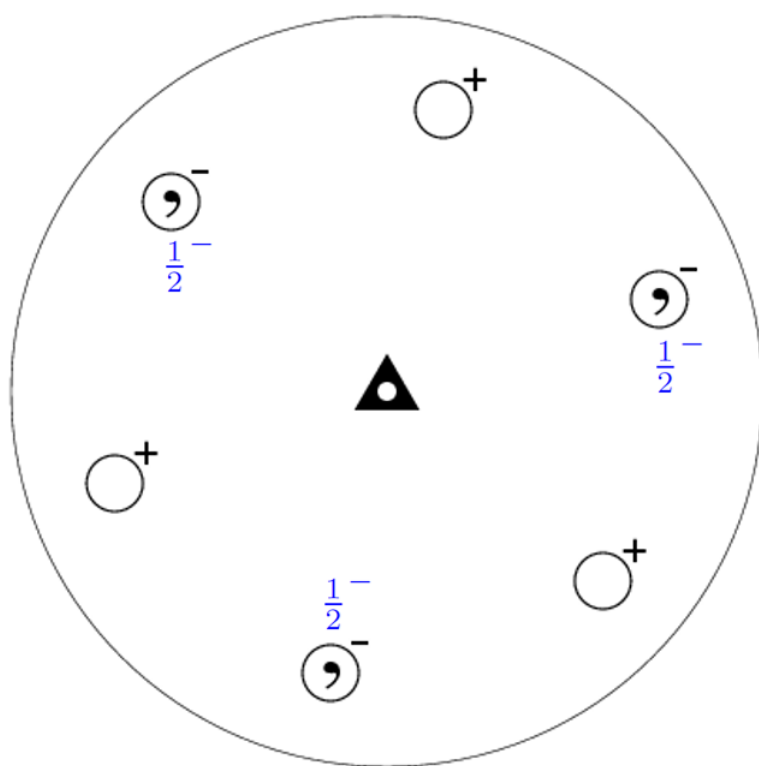
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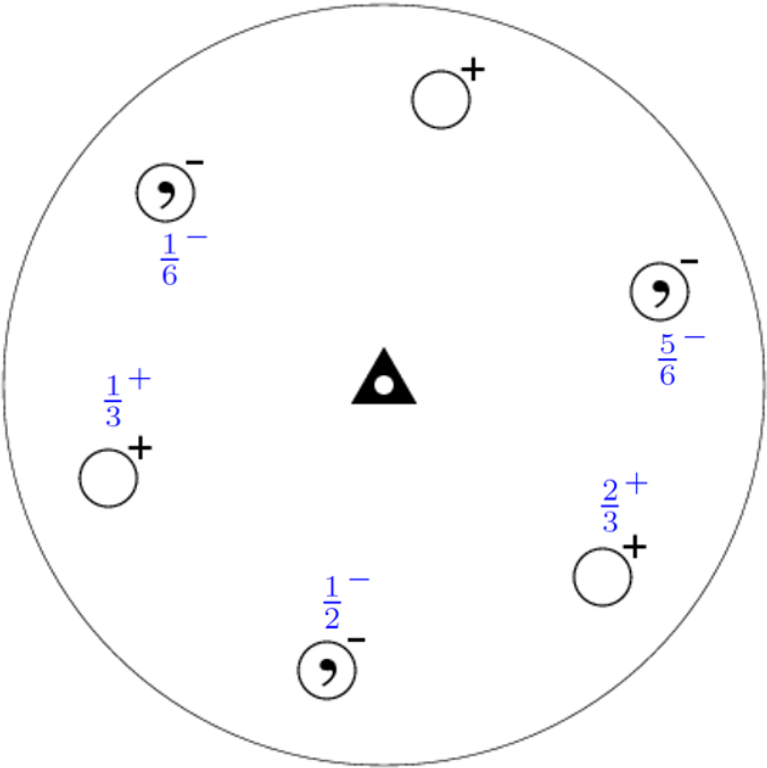


17.3.53

3

$\bar{3}$

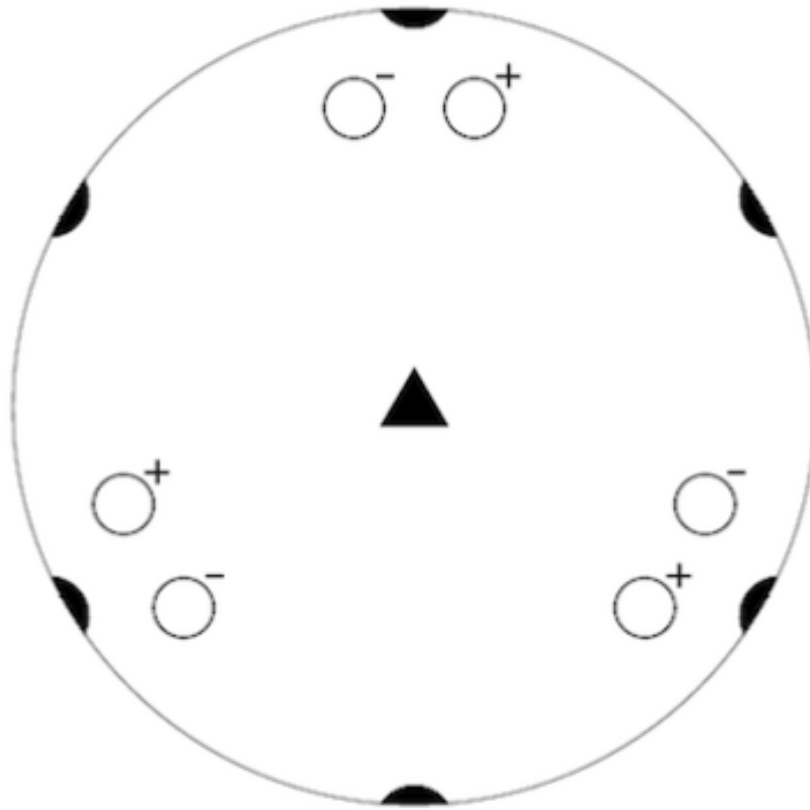




18.1.55

32

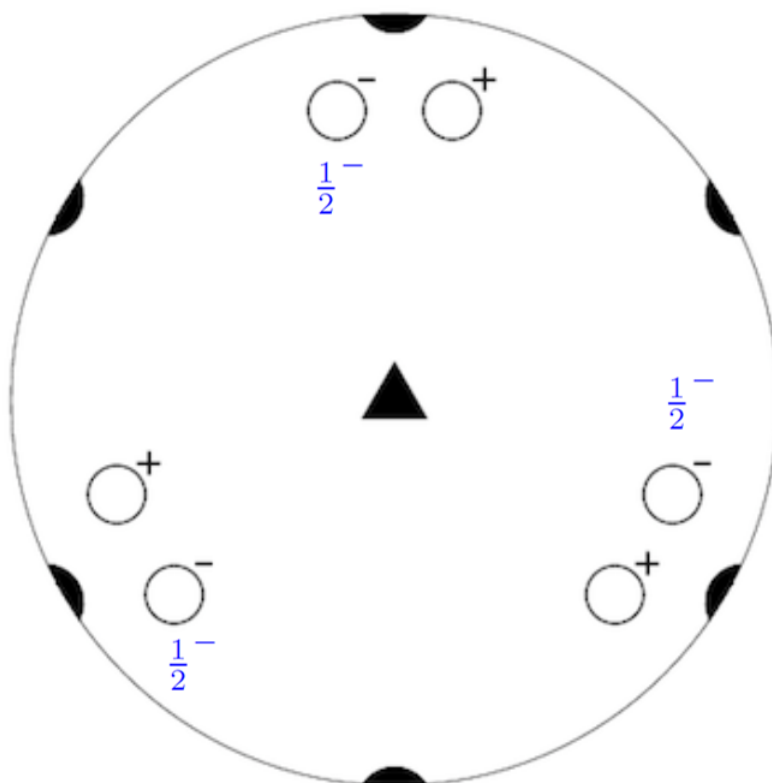
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18.2.56

3

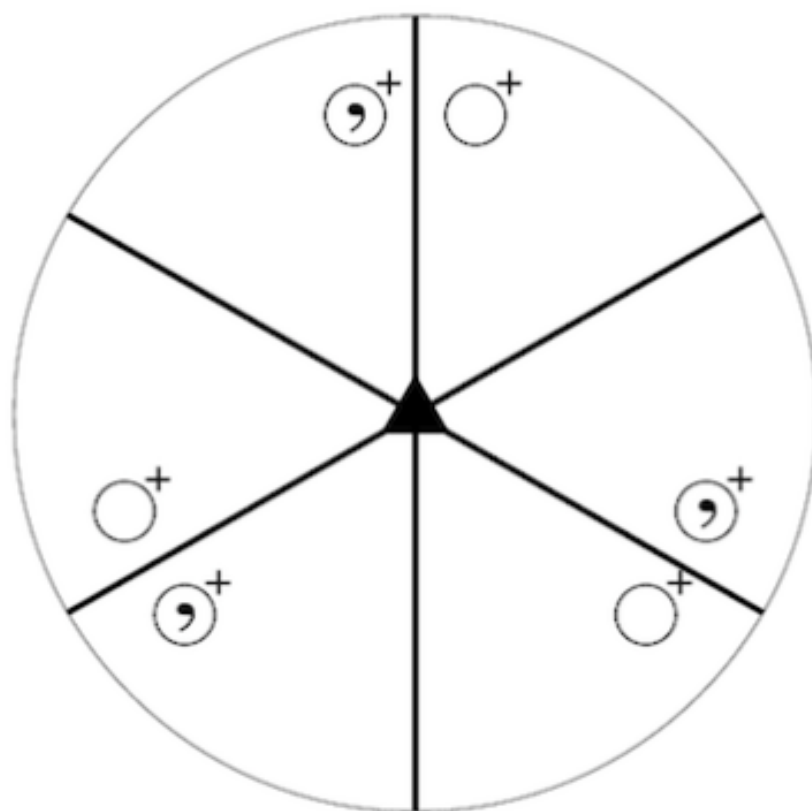
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19.1.57

3m

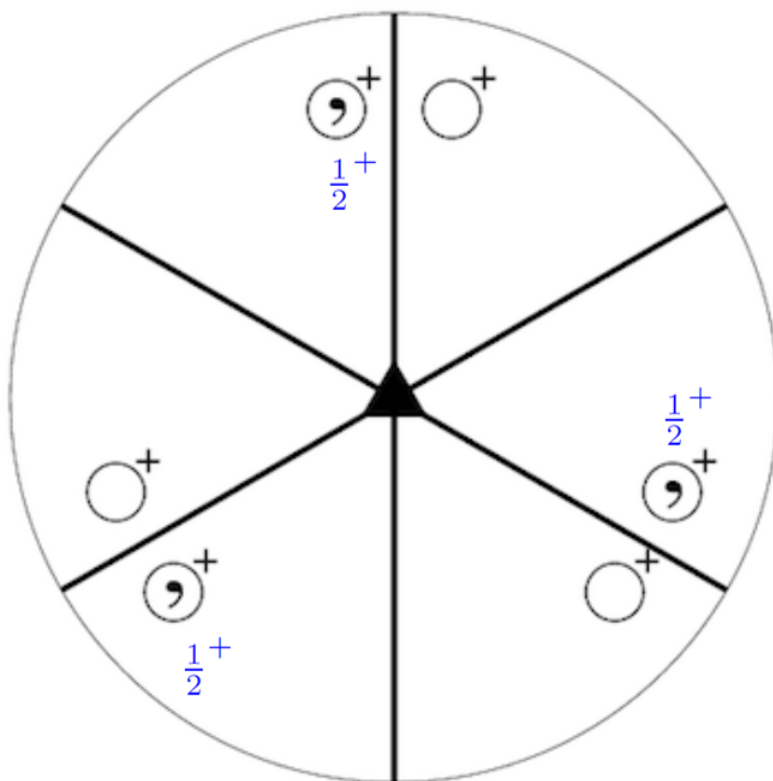
3m



19.2.58

3

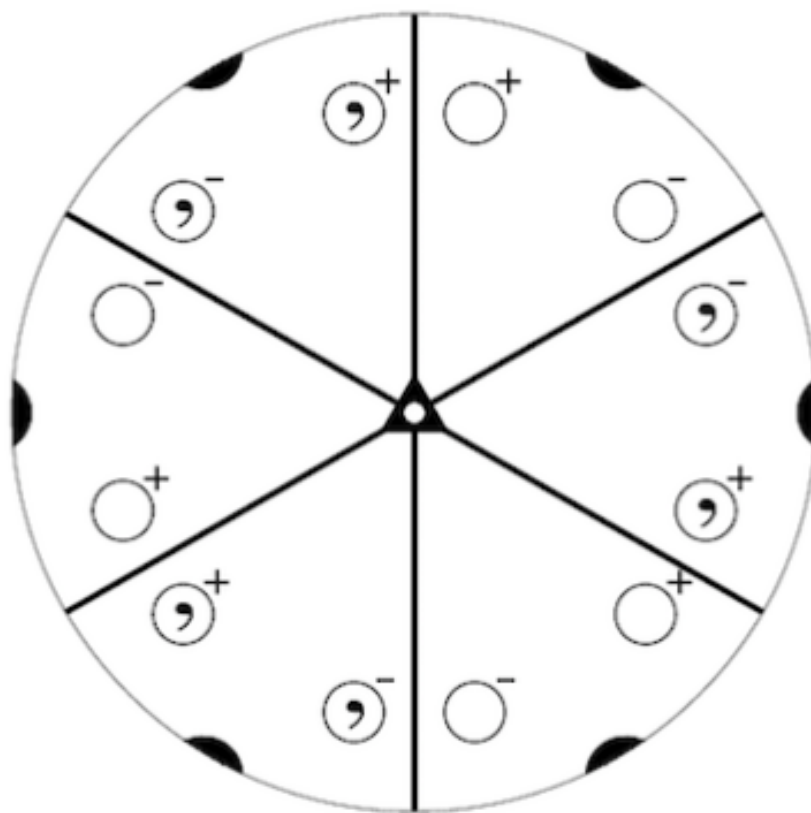
3m



20.1.59

$\bar{3}m$

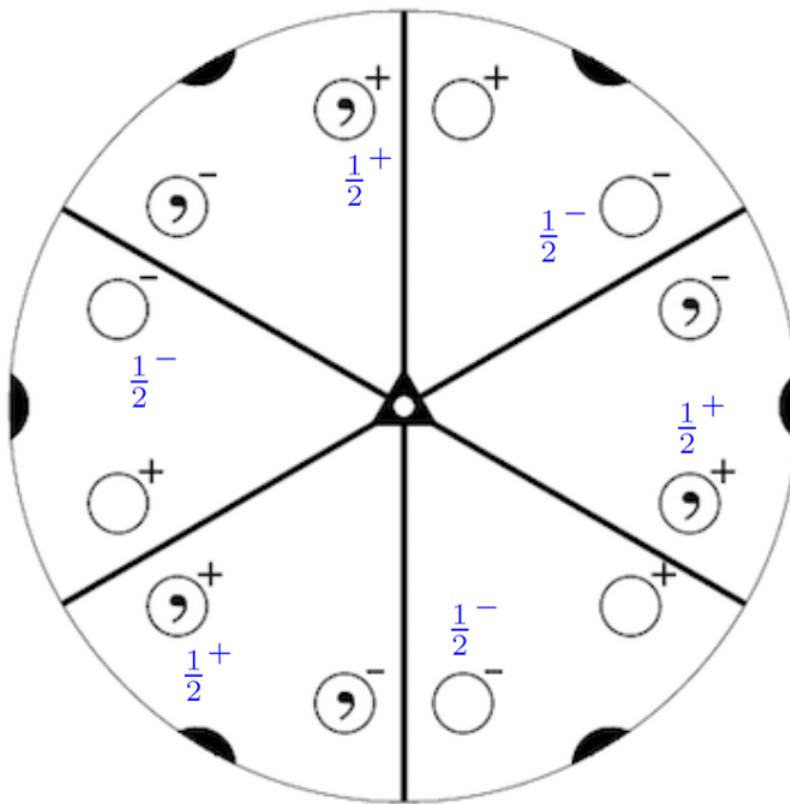
$\bar{3}m$



20.2.60

$\bar{3}$

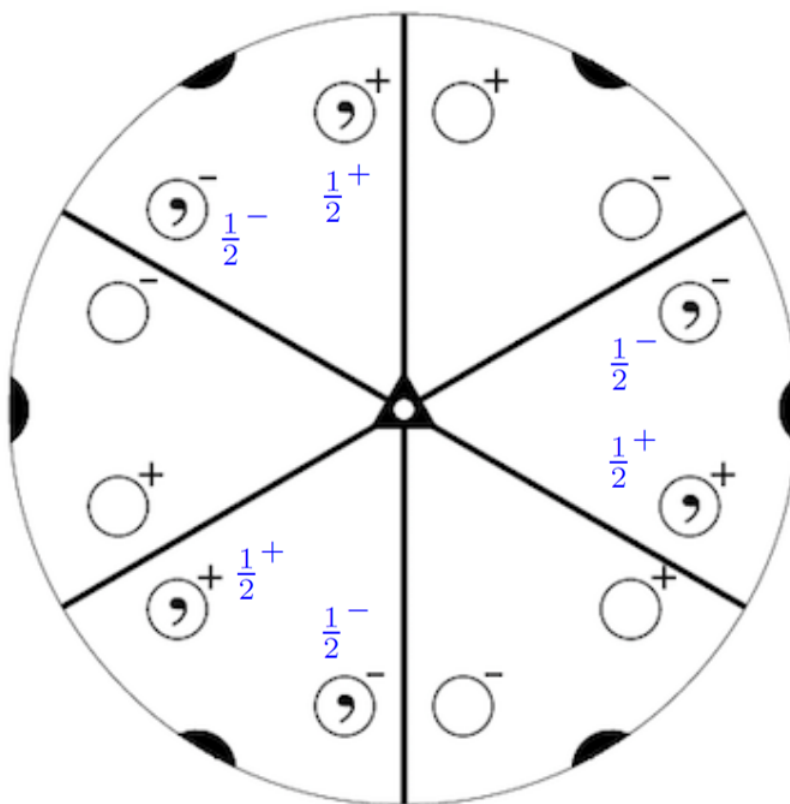
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20.3.61

32

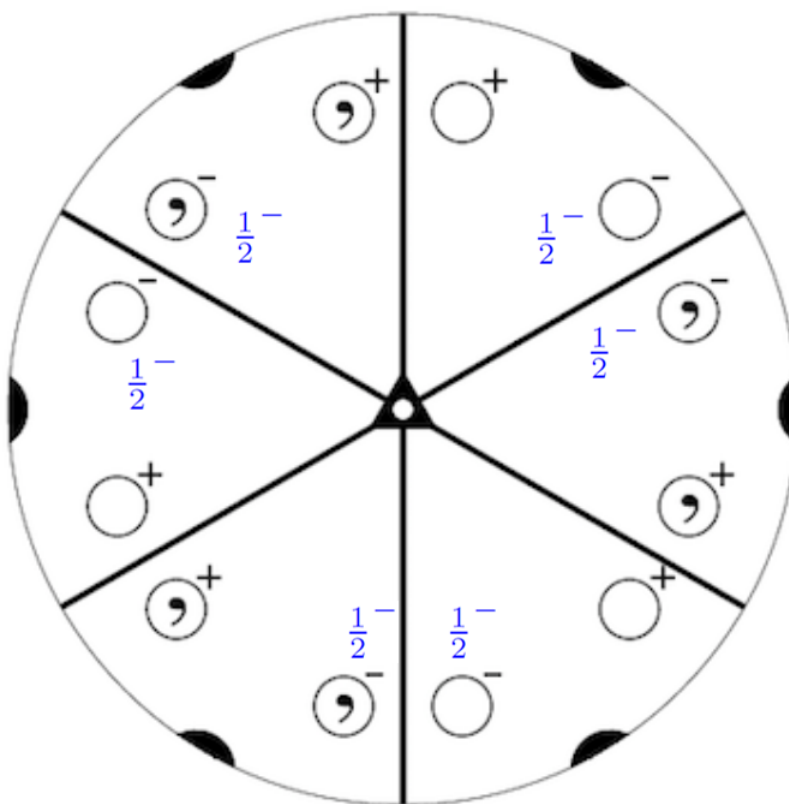
$\bar{3}m$



20.4.62

3m

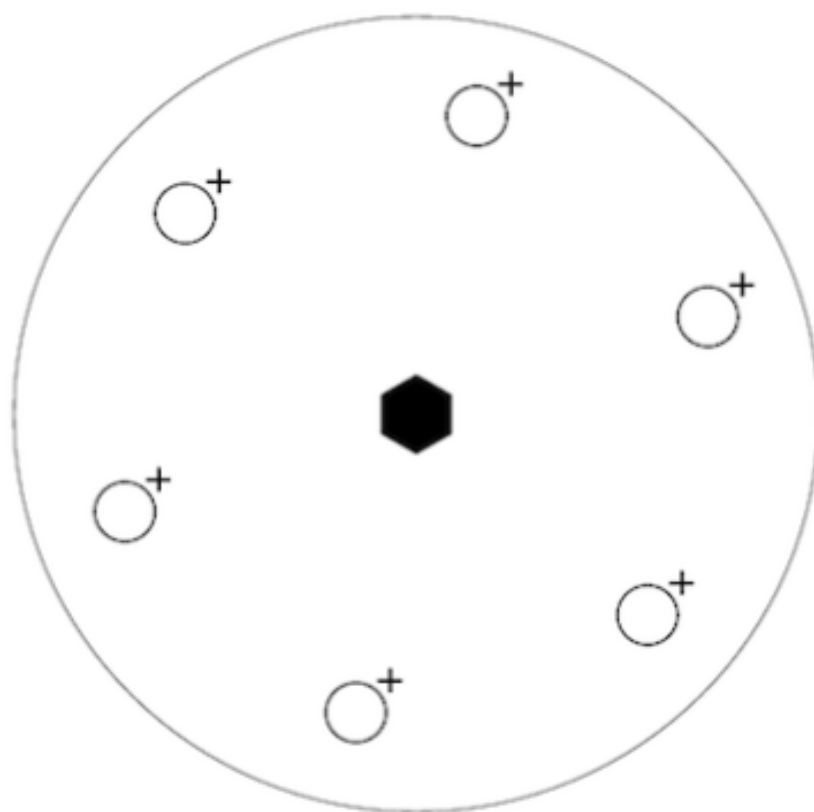
$\bar{3}m$



21.1.63

6

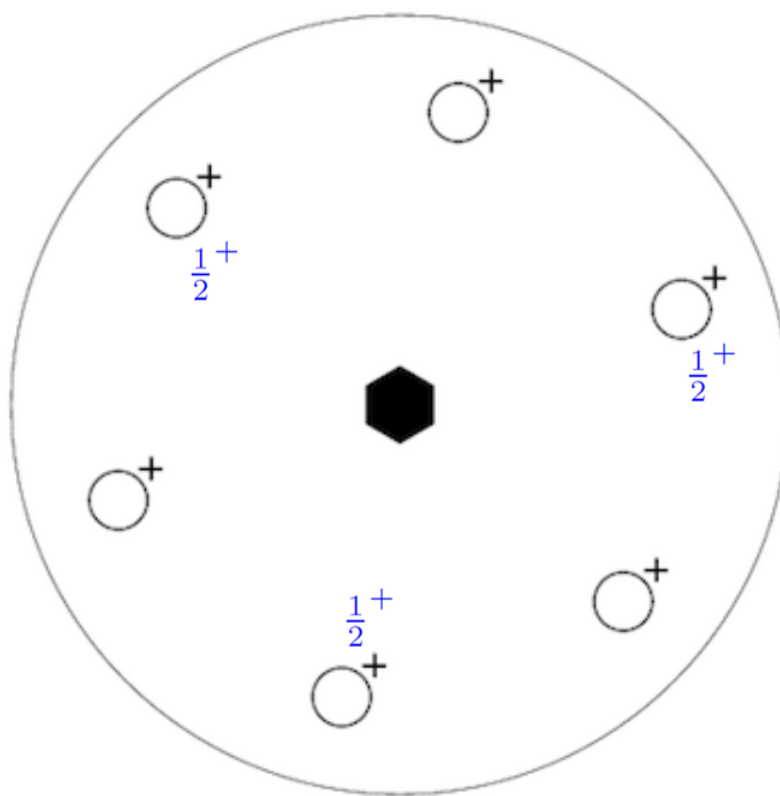
6



21.2.64

3

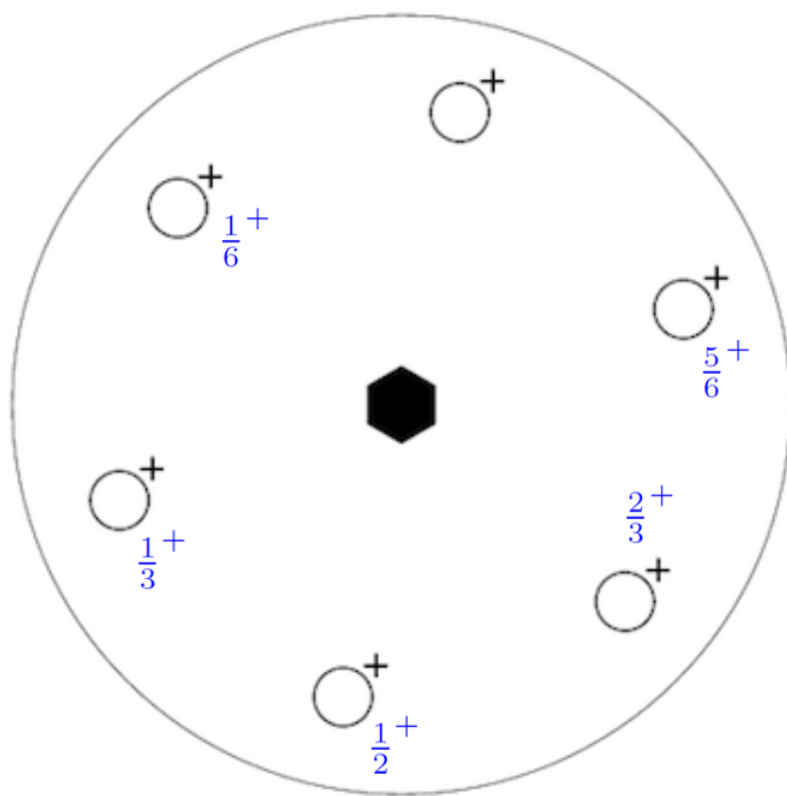
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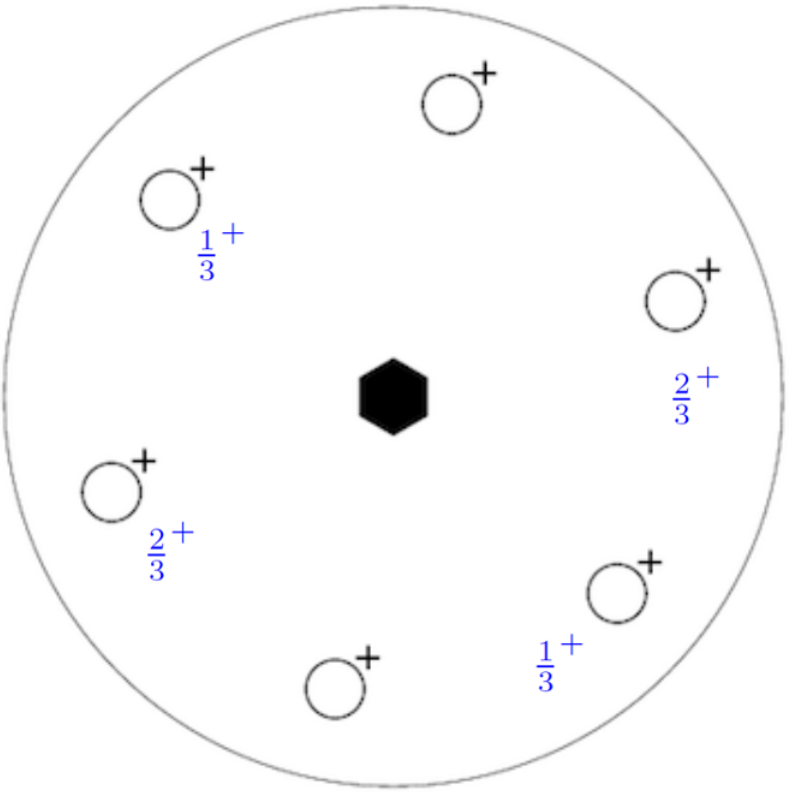


21.3.65

1

6

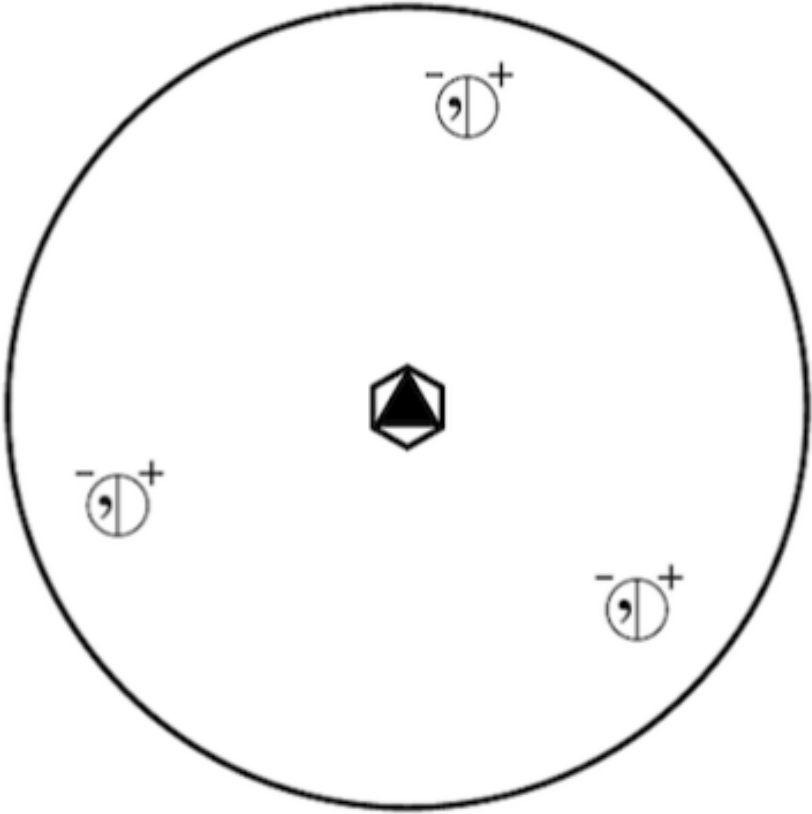




22.1.67

$\bar{6}$

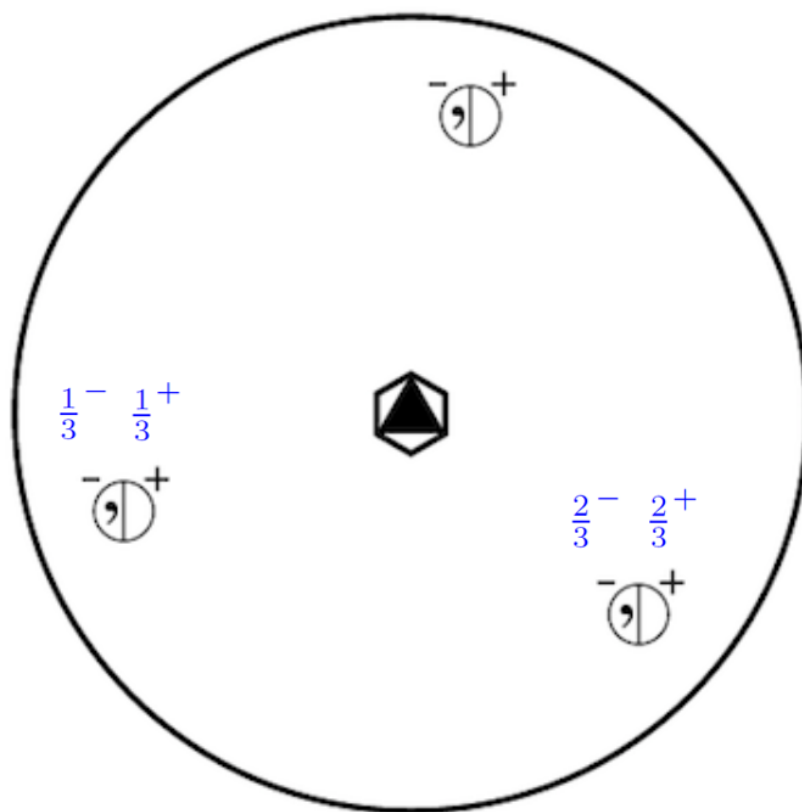
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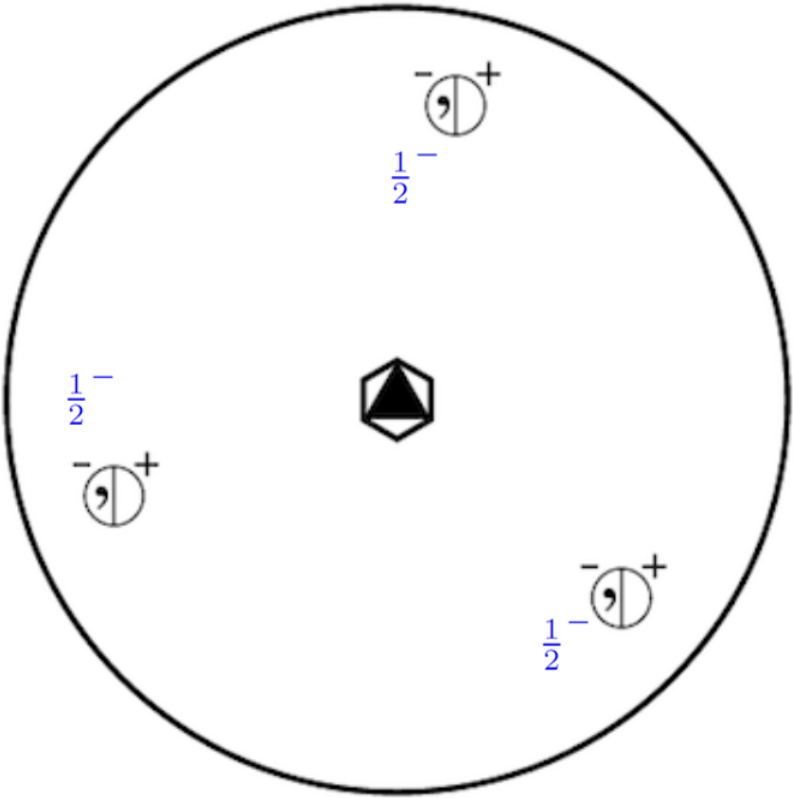


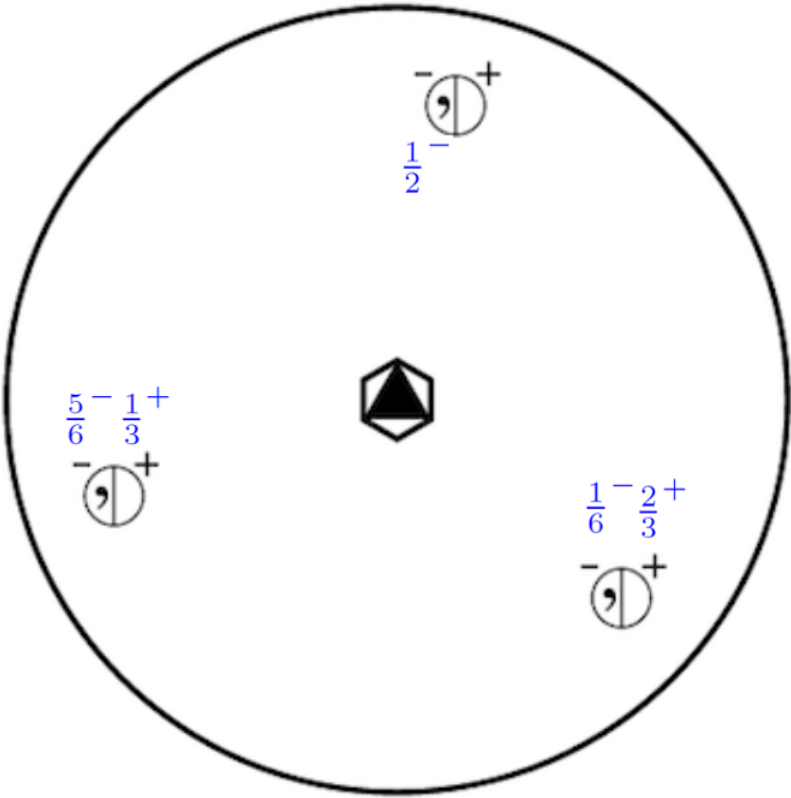
22.2.68

m

$\bar{6}$



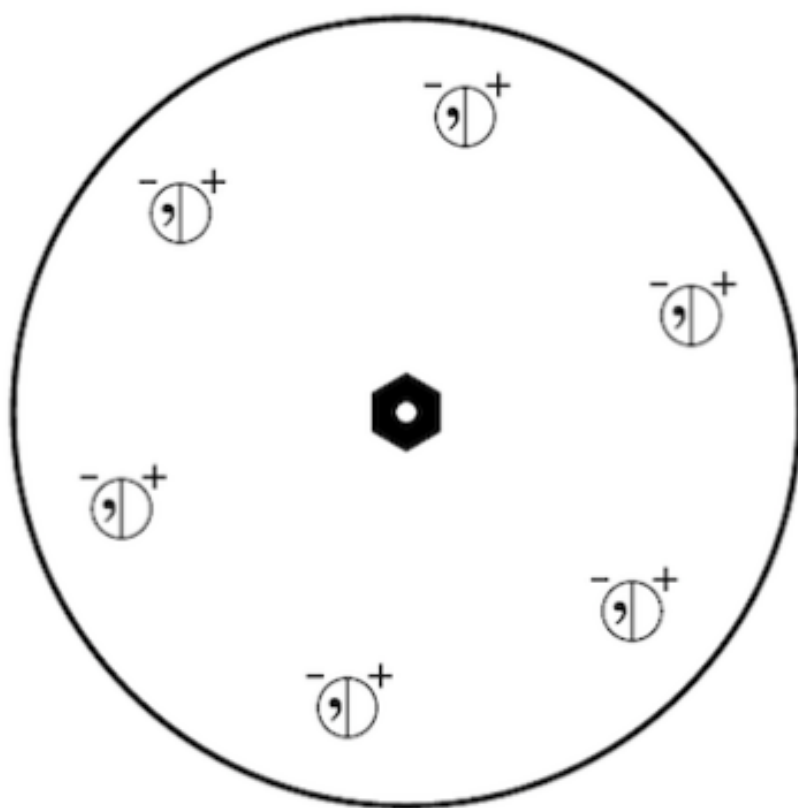




23.1.71

6/m

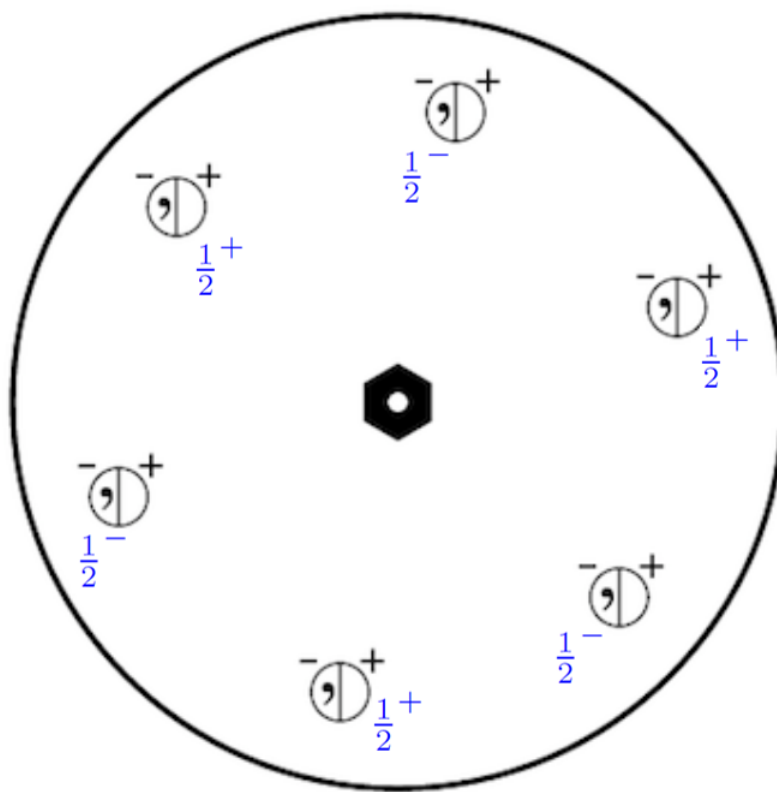
6/m



23.2.72

$\bar{3}$

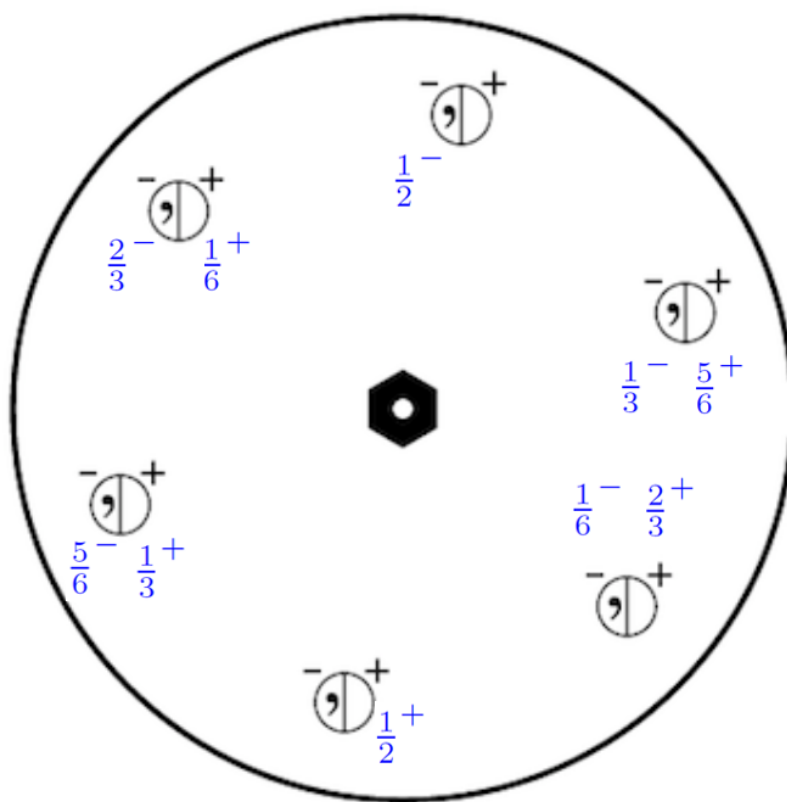
6/m



23.3.73

$\bar{1}$

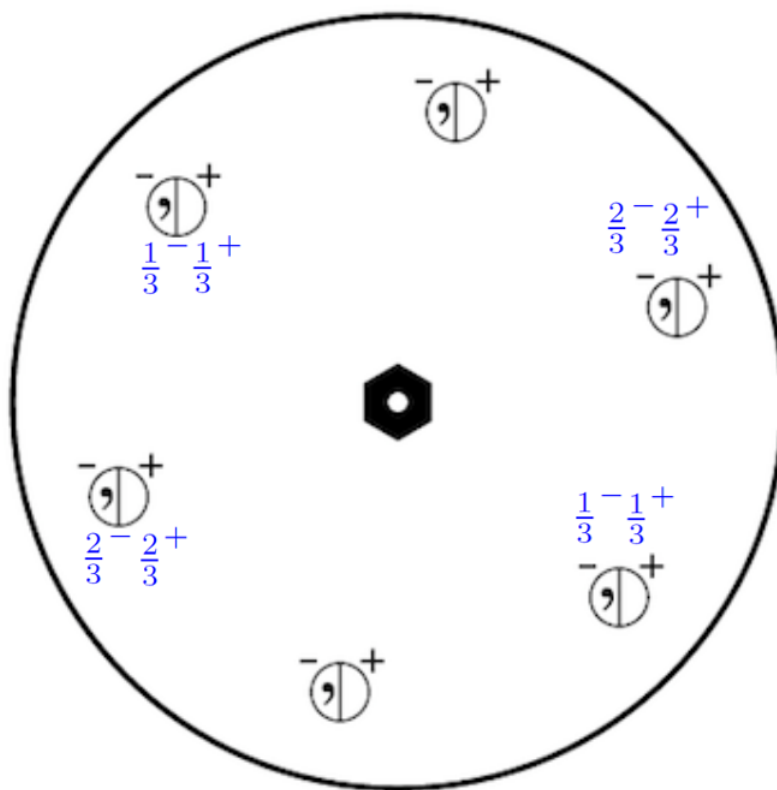
6/m



23.4.74

2/m

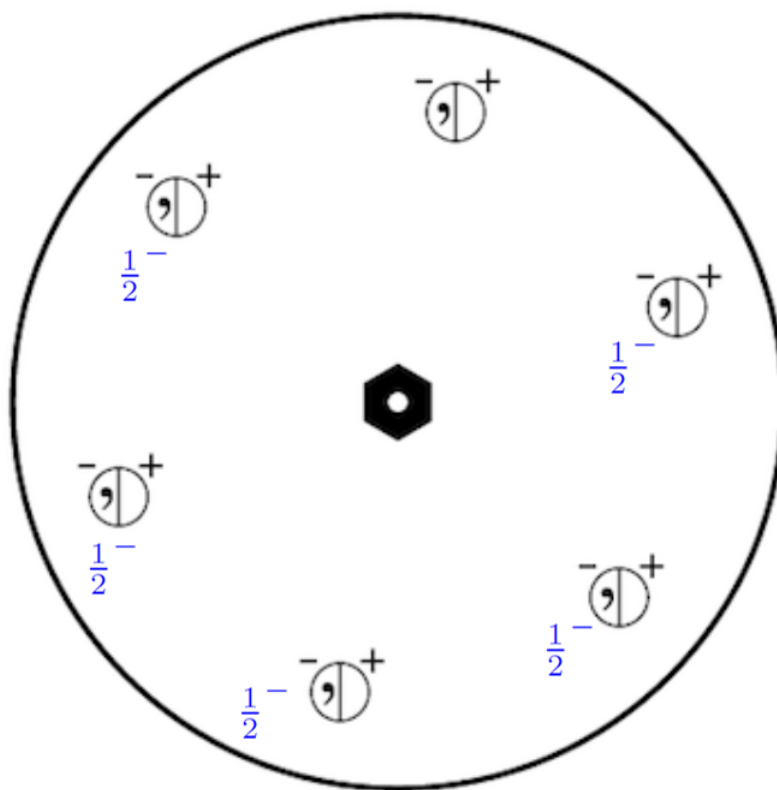
6/m



23.5.75

6

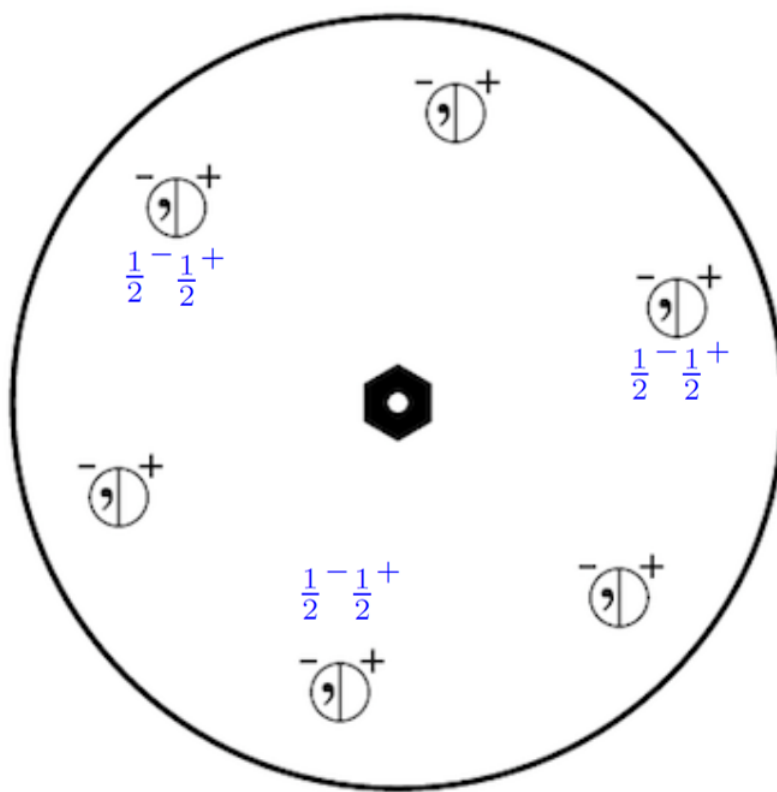
6/m



23.6.76

$\bar{6}$

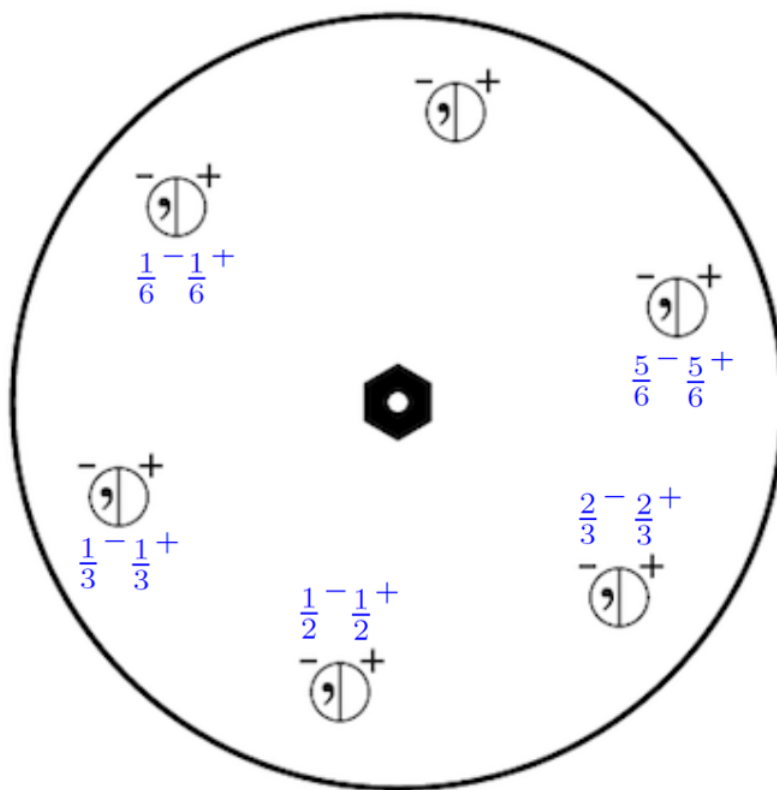
6/m



23.7.77

m

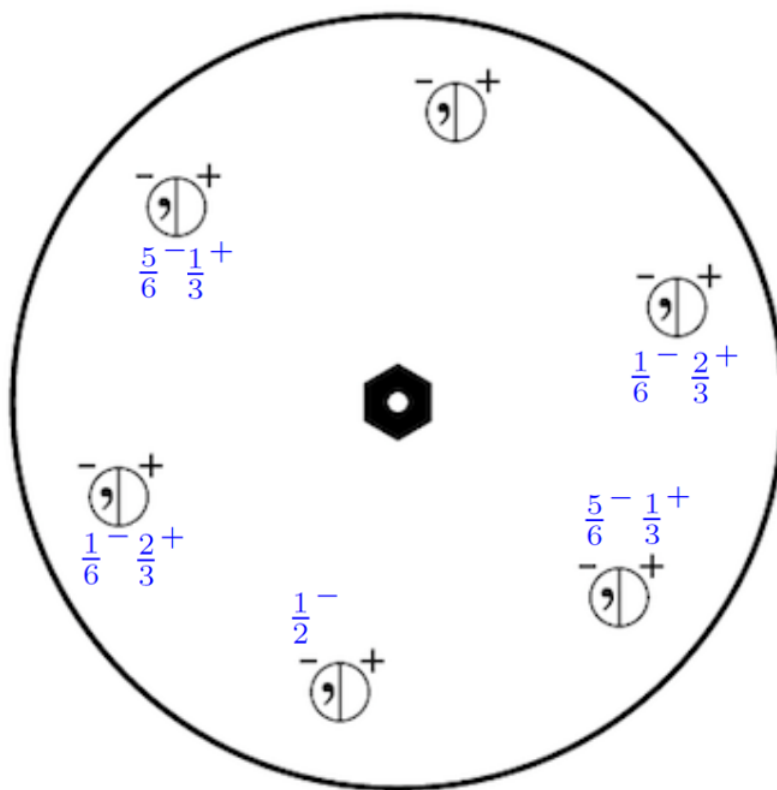
6/m



23.8.78

2

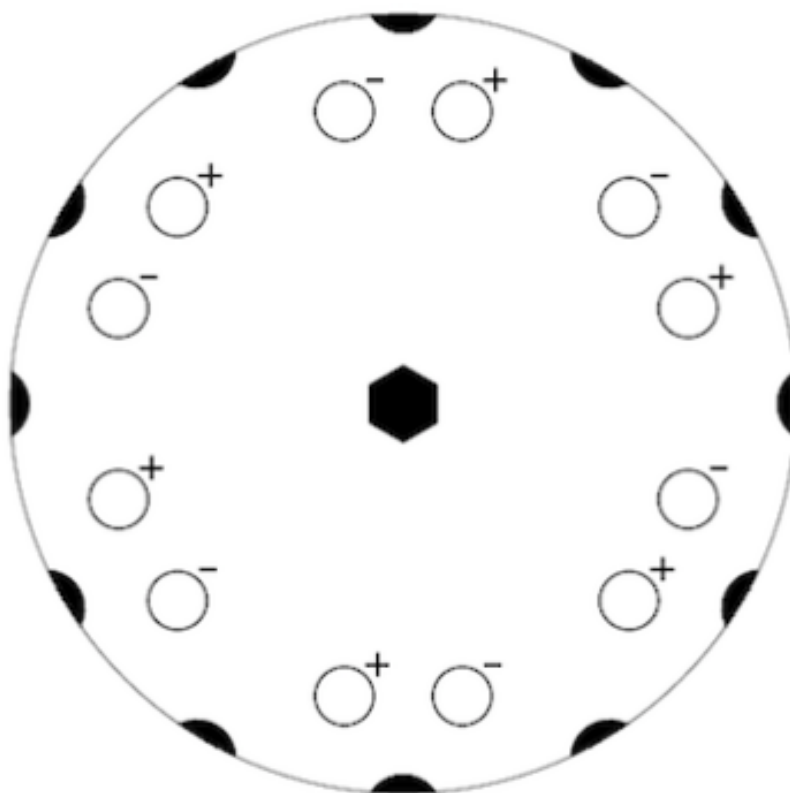
6/m

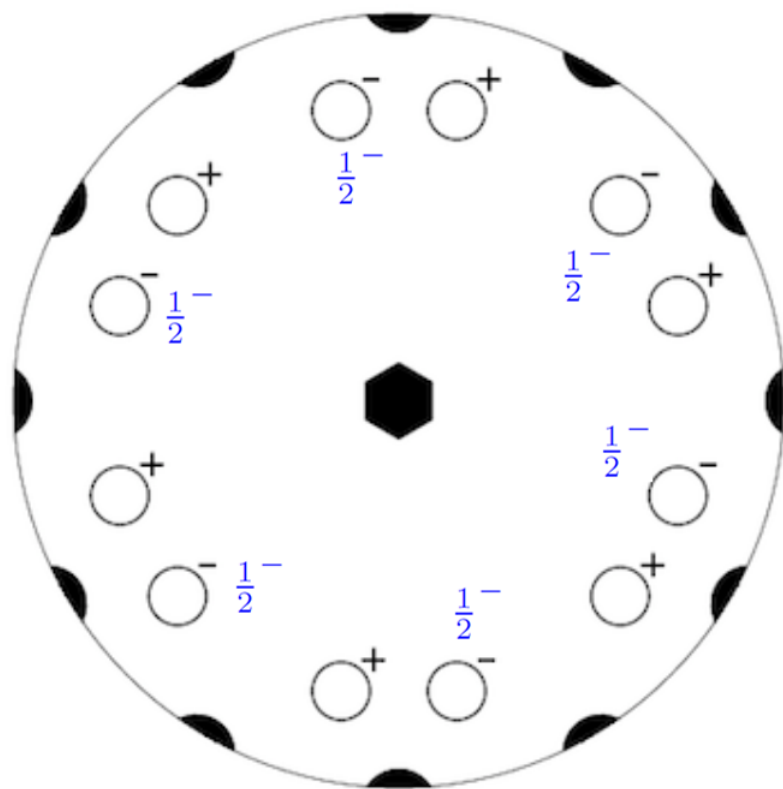


24.1.79

622

622

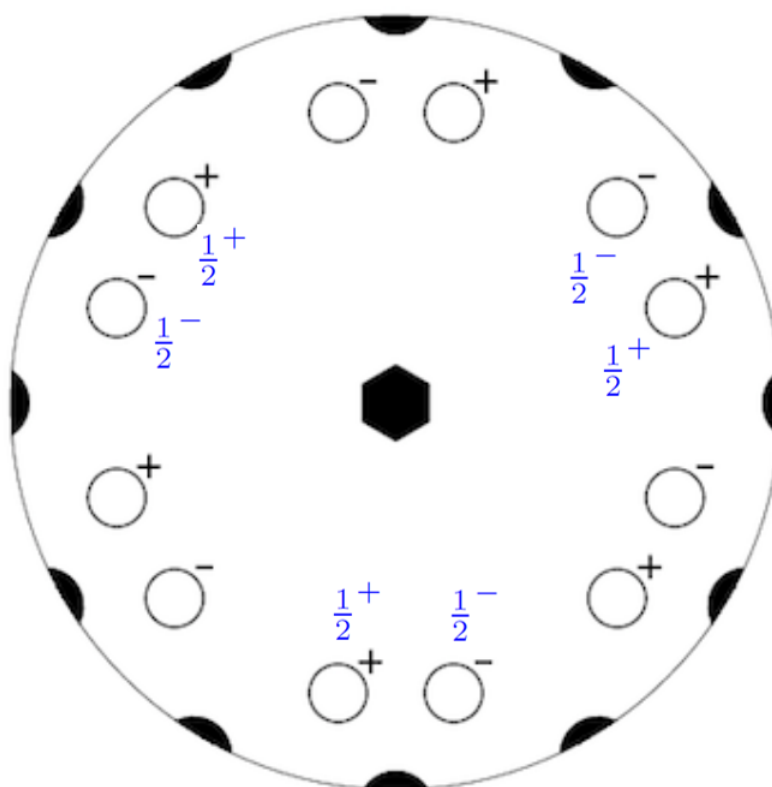




24.3.81

32

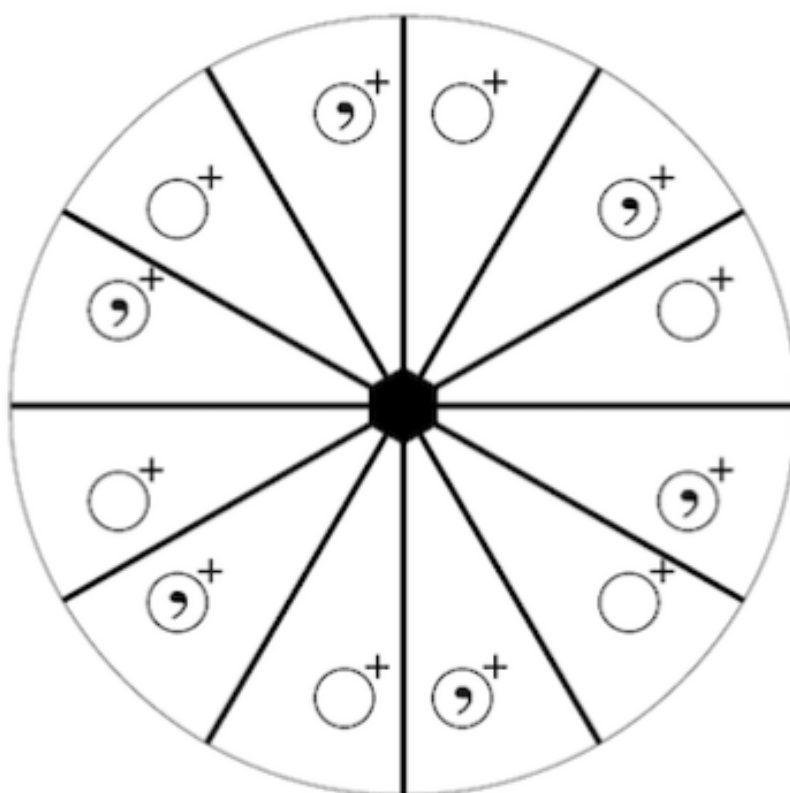
622



25.1.82

6mm

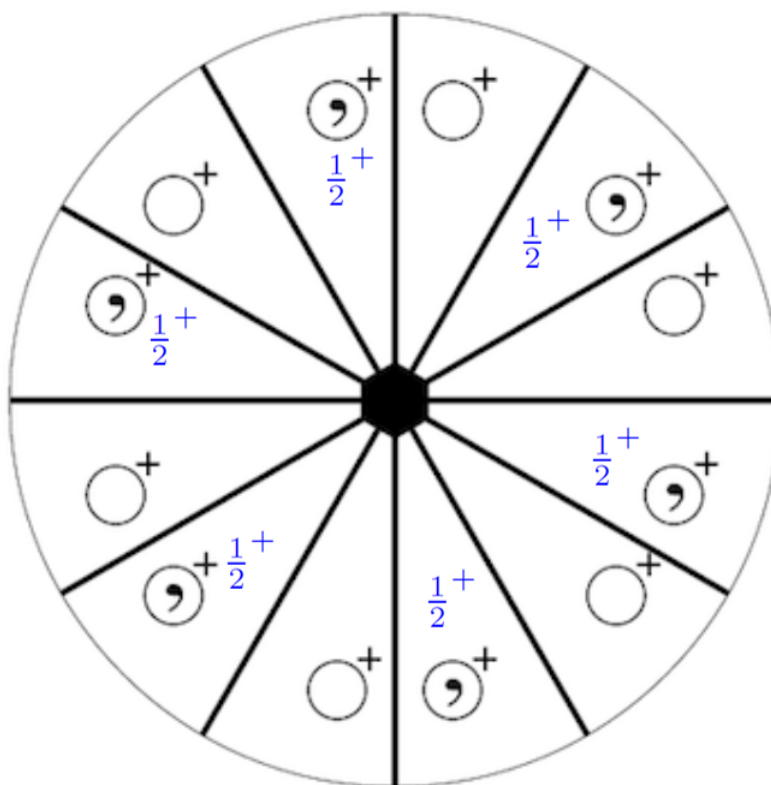
6mm



25.2.83

6

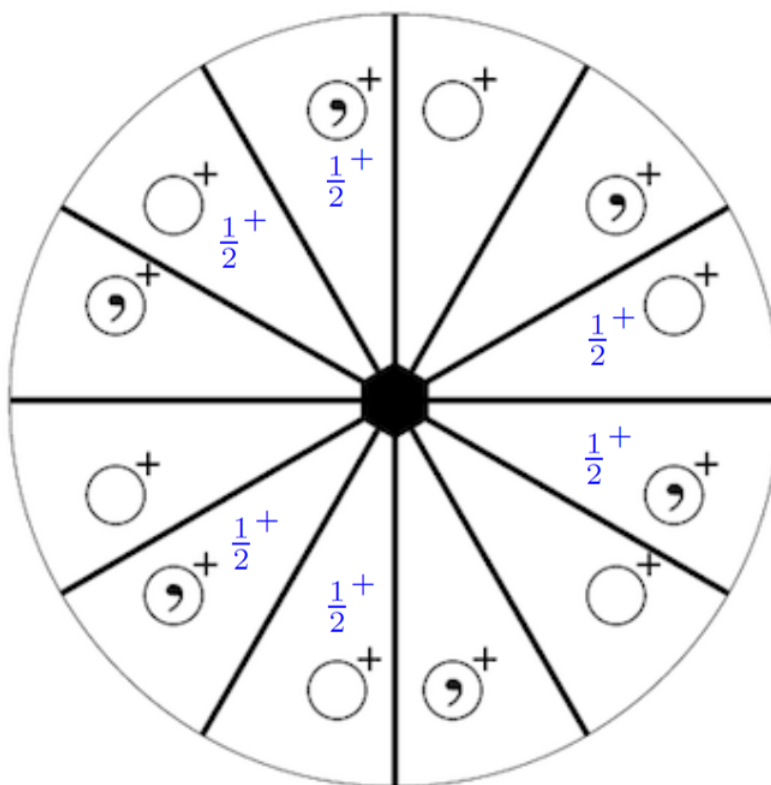
6mm



25.3.84

3m

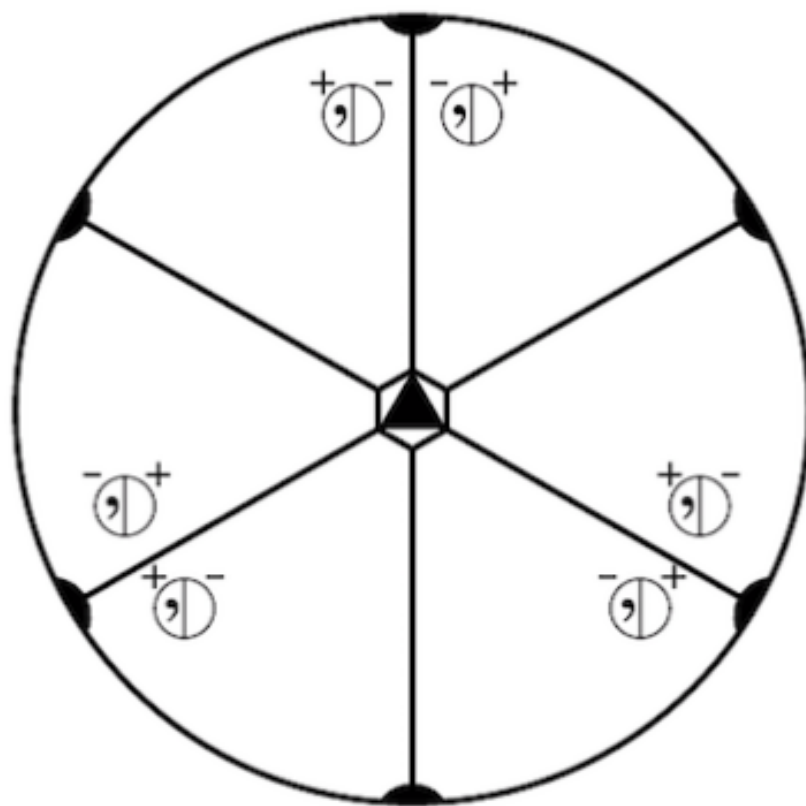
6mm



26.1.85

$\bar{6}2m$

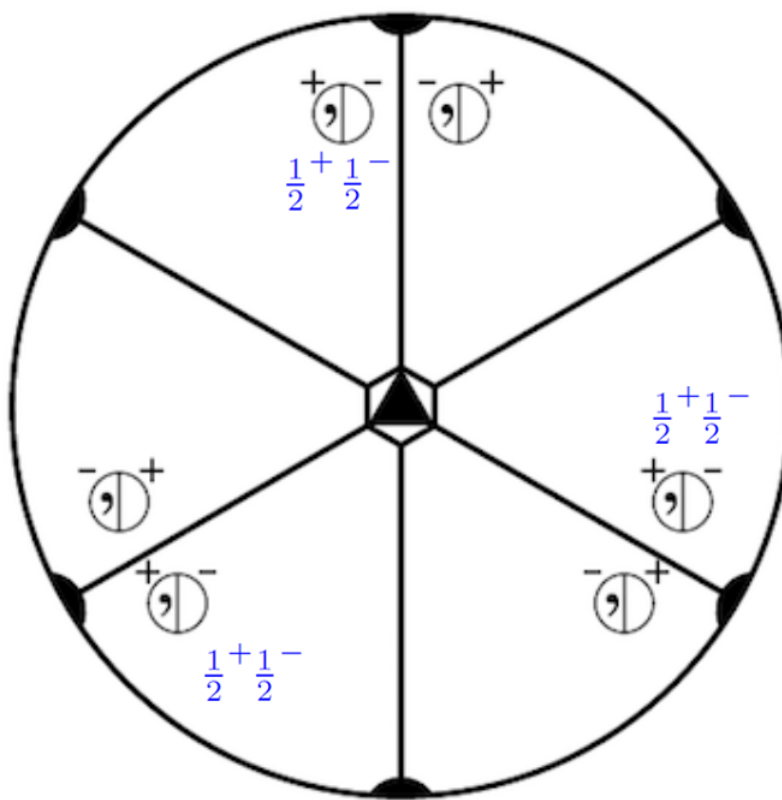
$\bar{6}2m$



26.2.86

$\bar{6}$

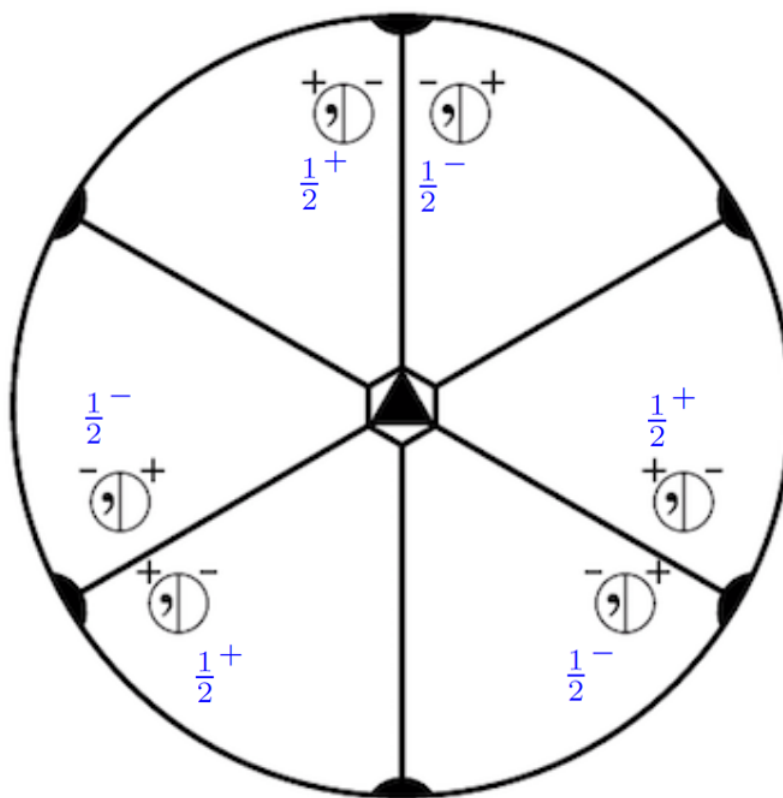
$\bar{6}2m$



26.3.87

32

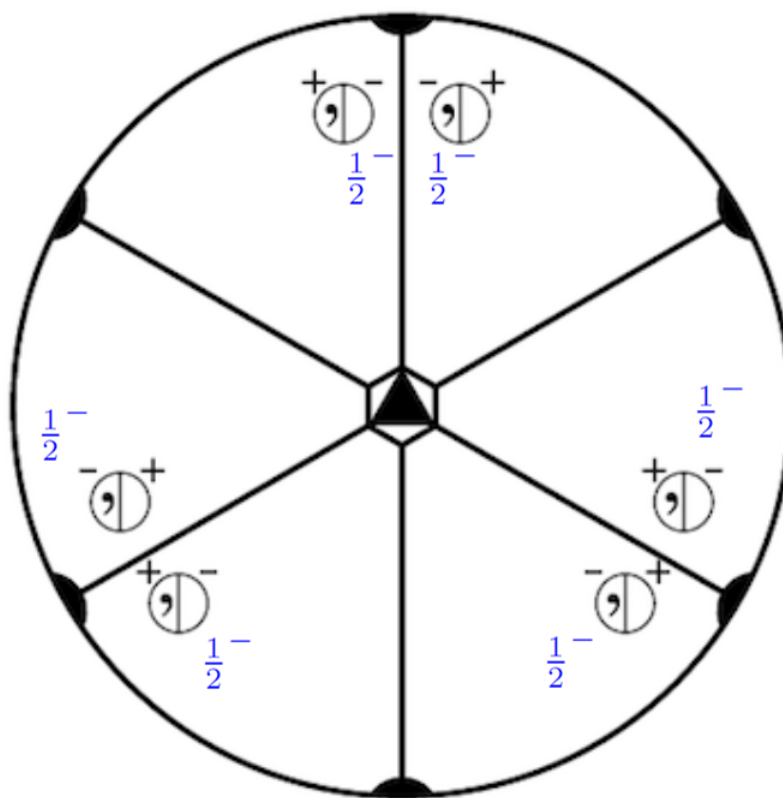
$\bar{6}2m$



26.4.88

3m

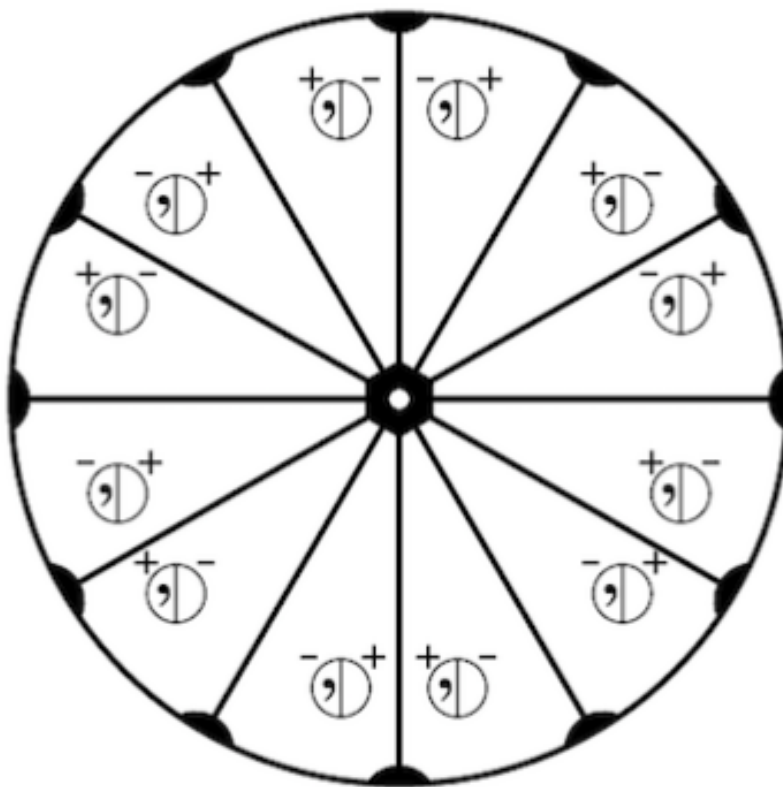
$\bar{6}2m$



27.1.89

6/mmm

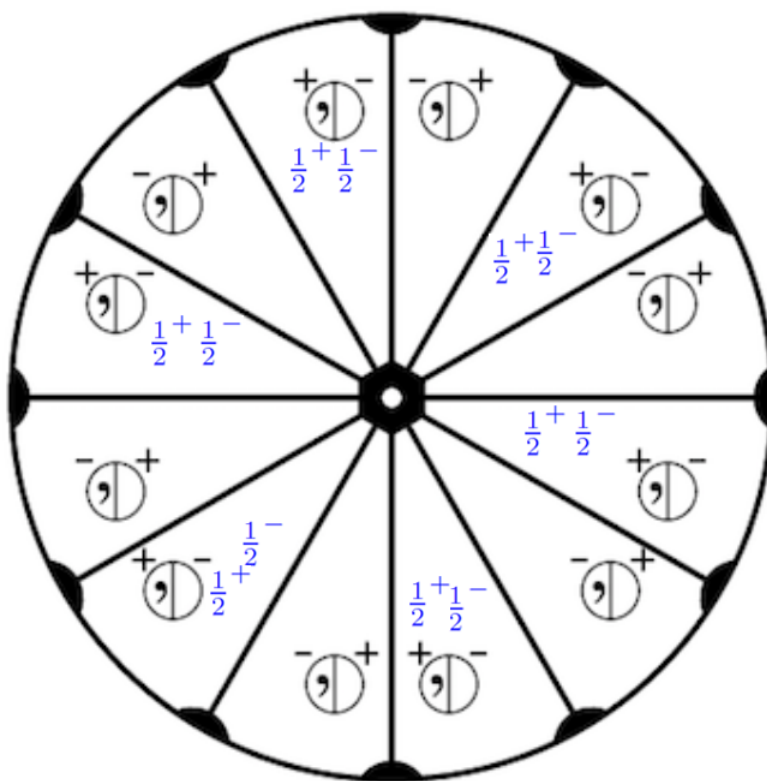
6/mmm



27.2.90

6

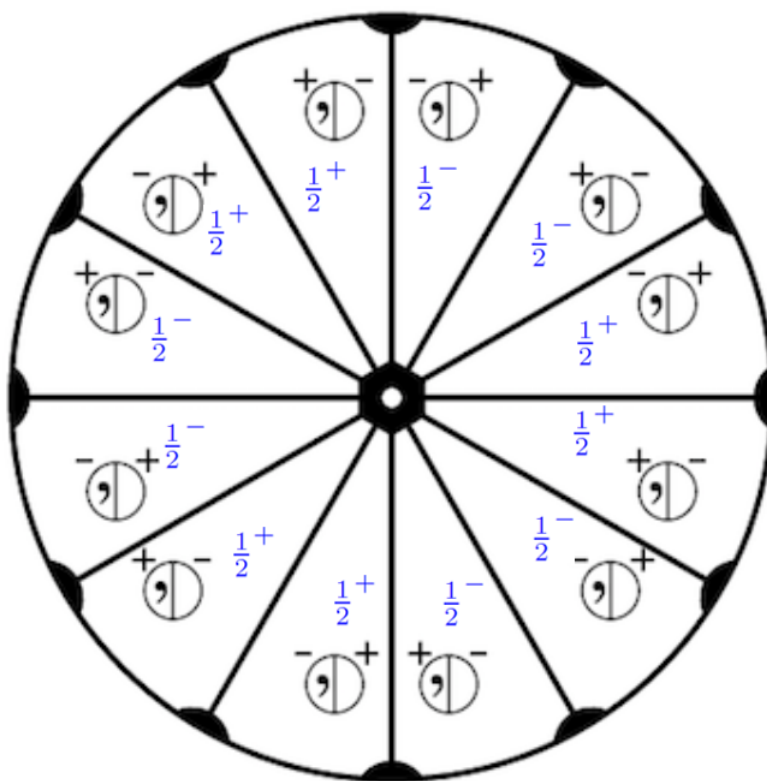
6/mmm



27.3.91

32

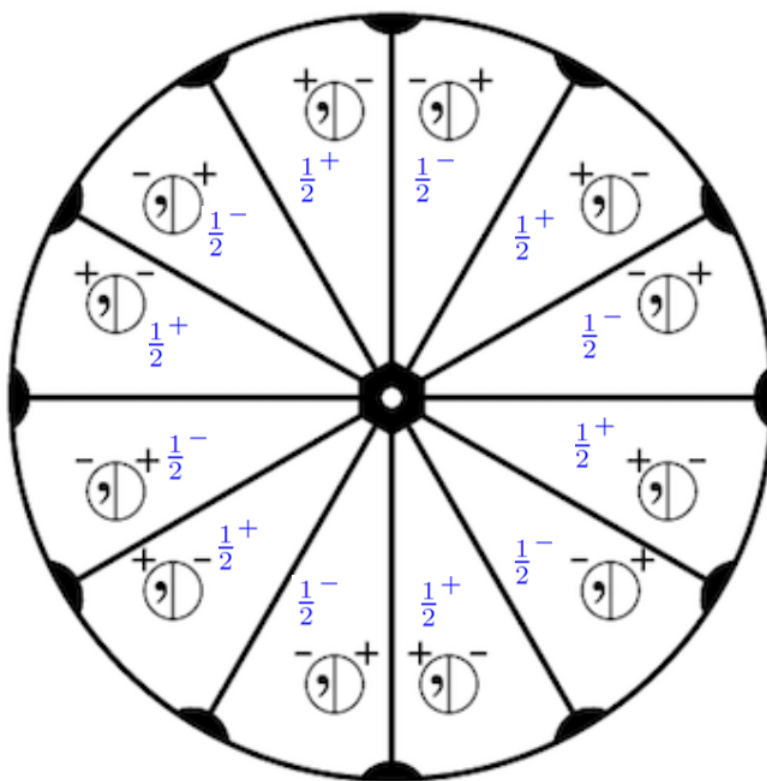
6/mmm



27.4.92

622

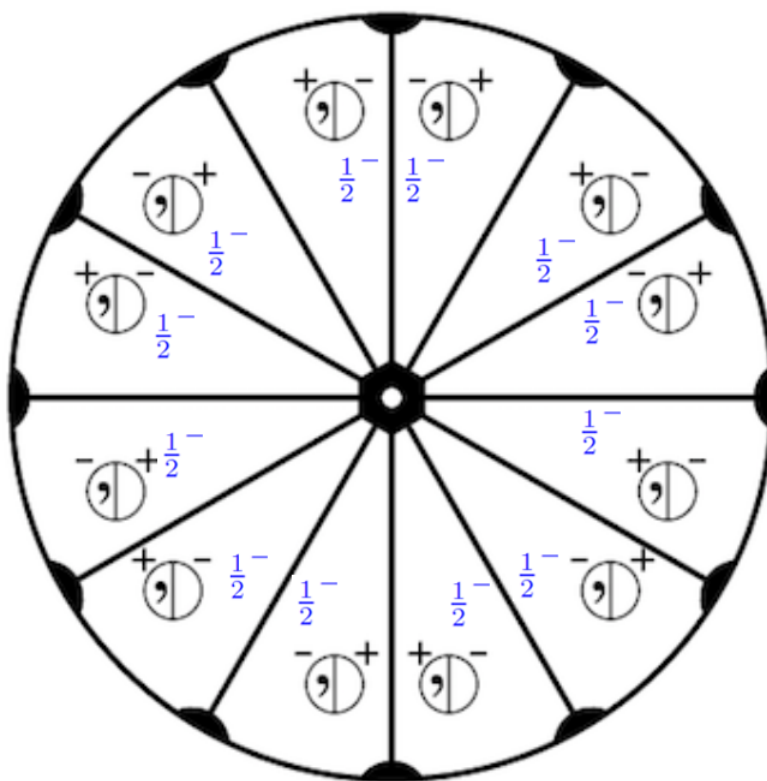
6/mmm



27.5.93

6mm

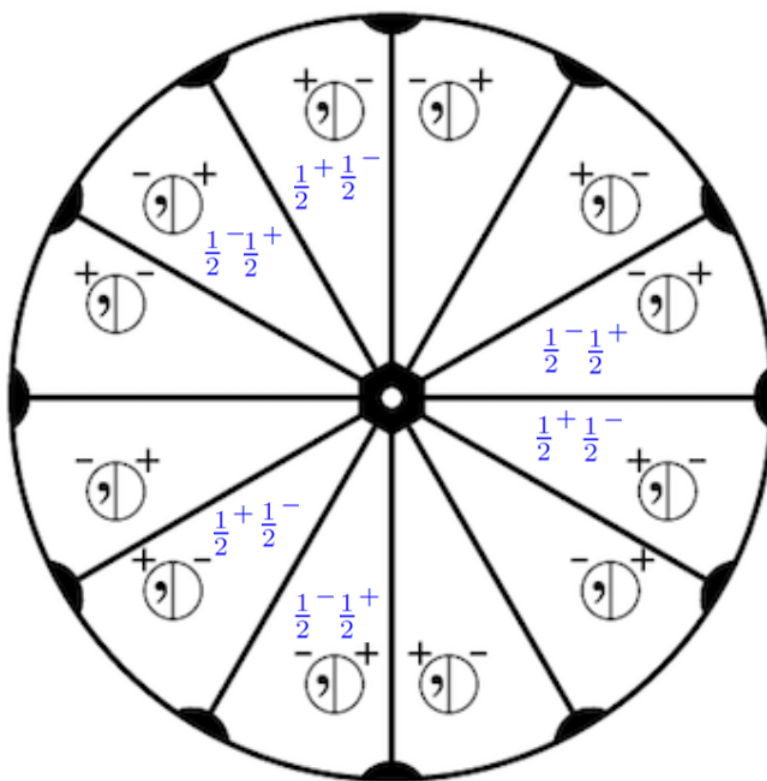
6/mmm

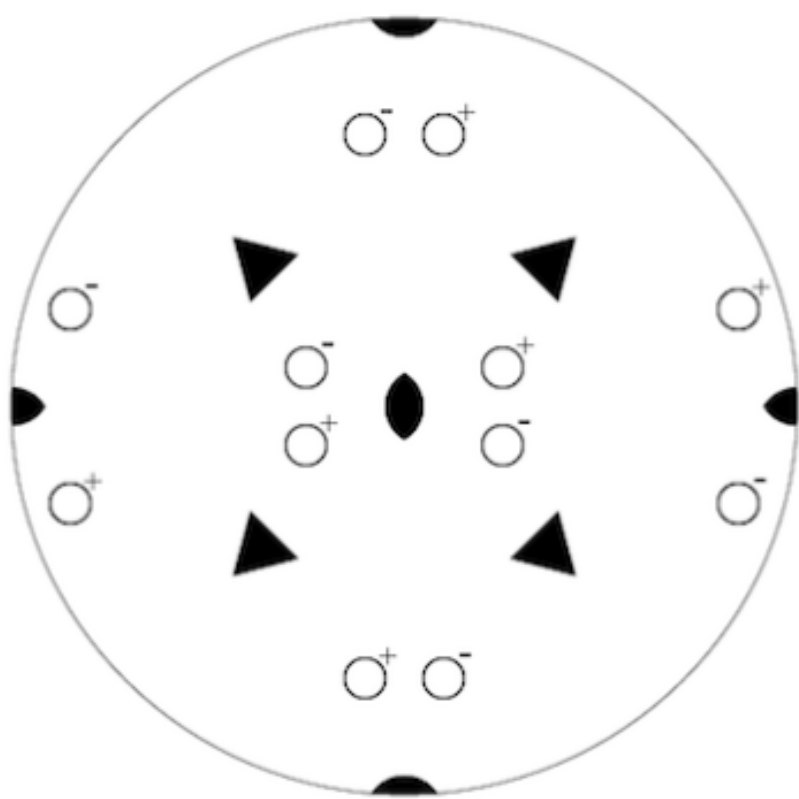


27.6.94

$\bar{6}2m$

$6/mmm$

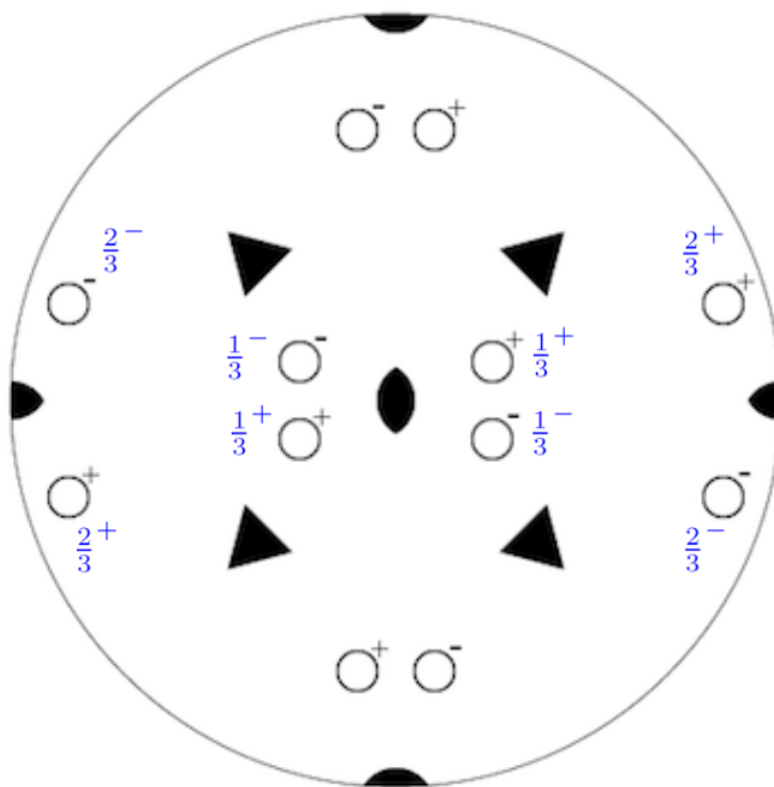




28.2.96

222

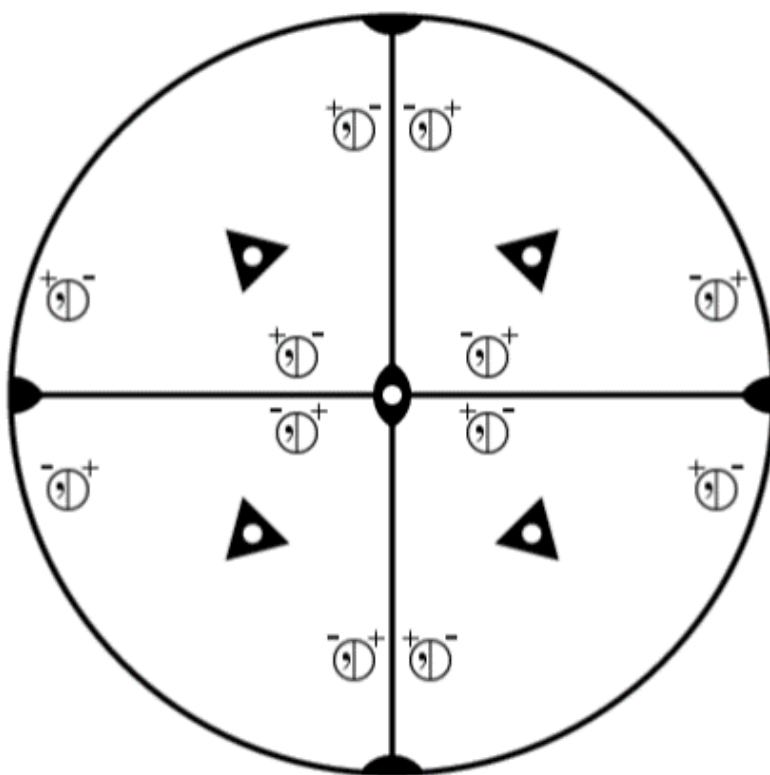
23



29.1.97

$m\bar{3}$

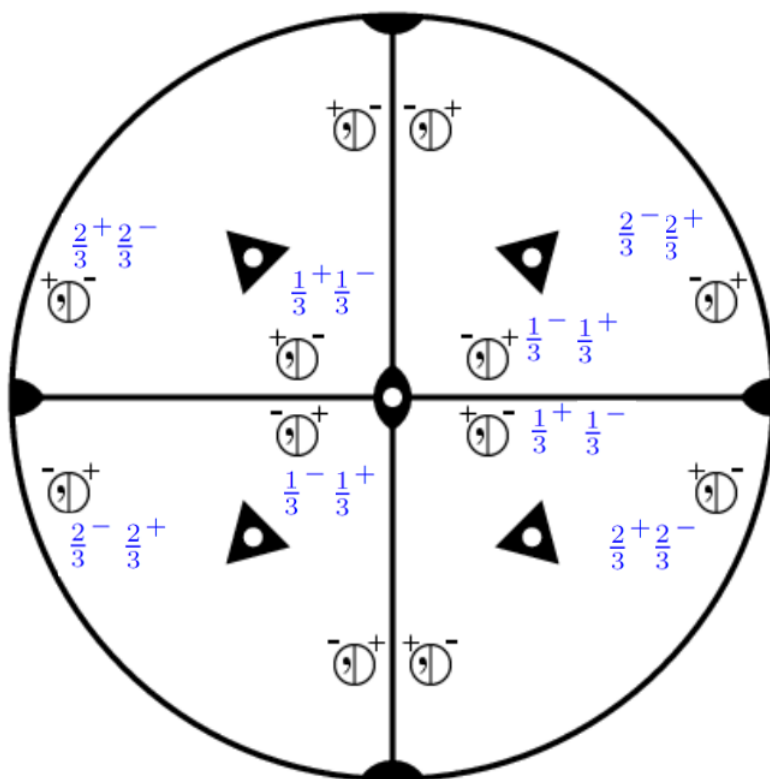
$m\bar{3}$



29.2.98

mmm

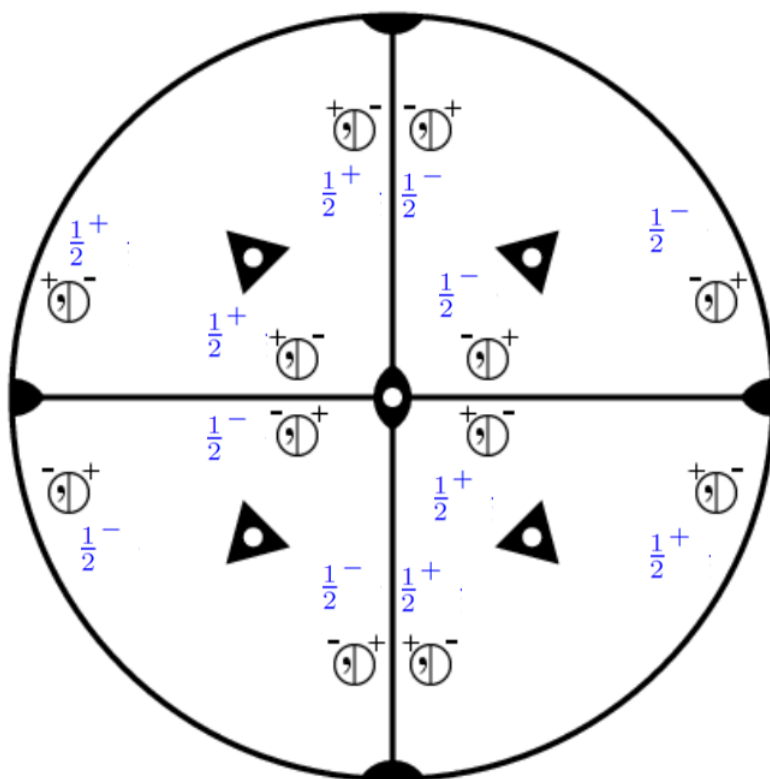
$m\bar{3}$



29.3.99

23

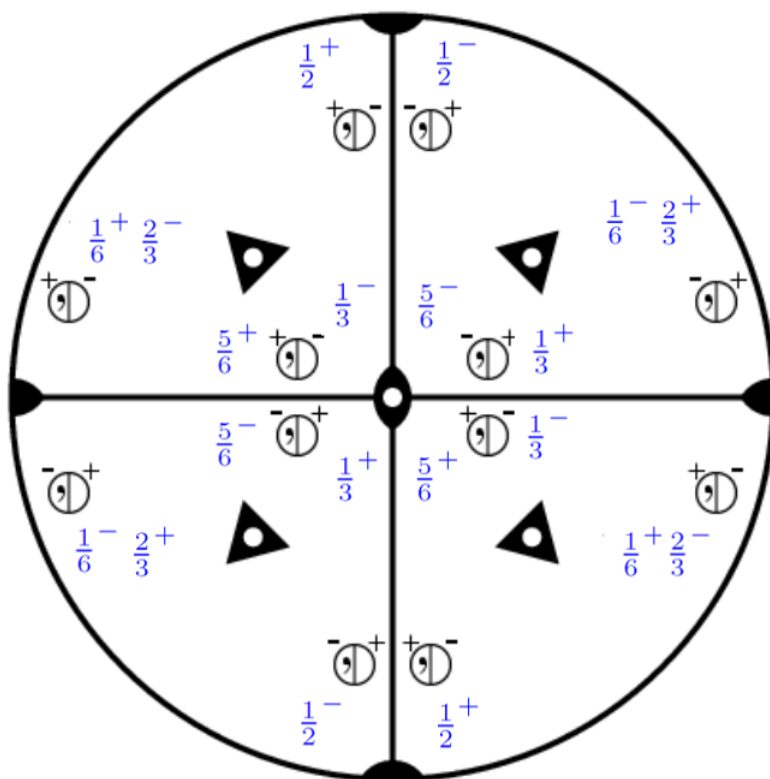
$m\bar{3}$



29.4.100

222

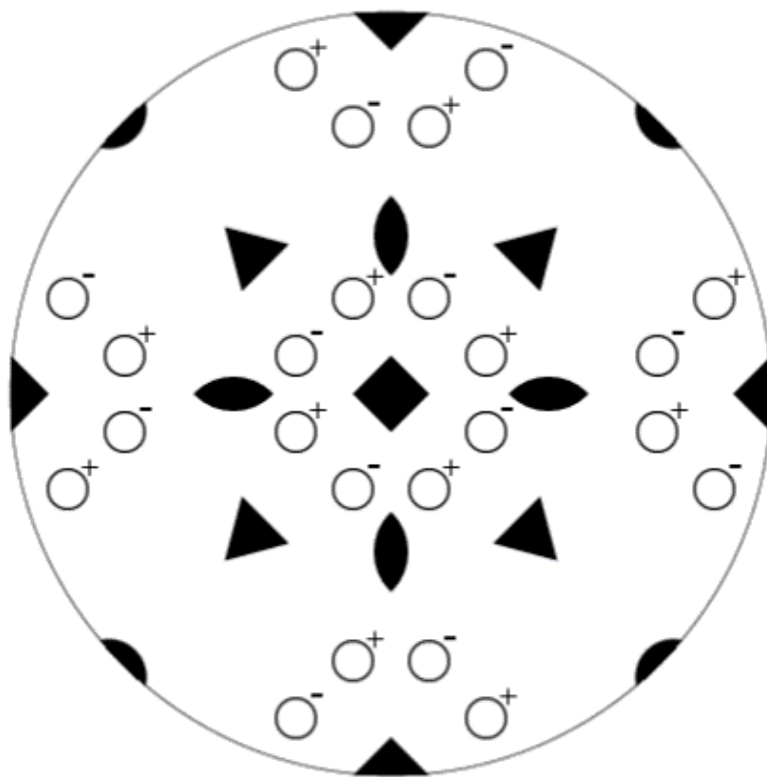
$m\bar{3}$

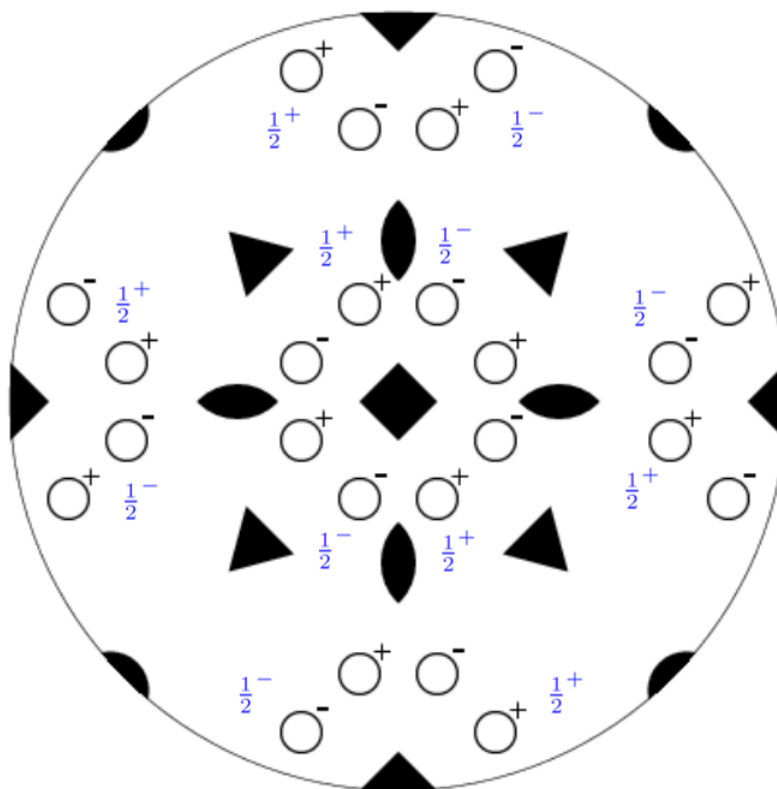


30.1.101

432

432

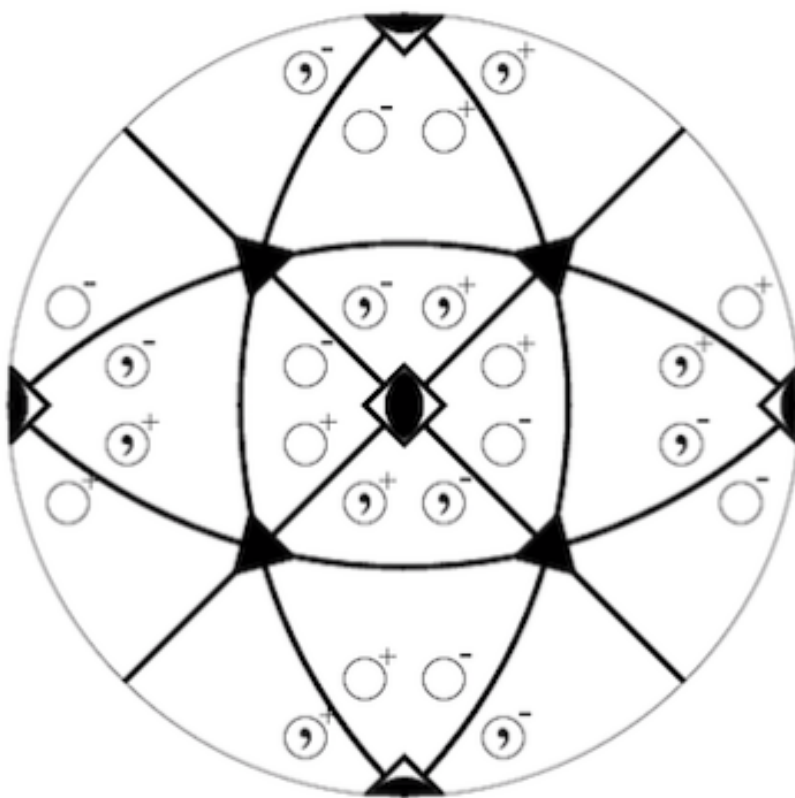




31.1.103

$\bar{4}3m$

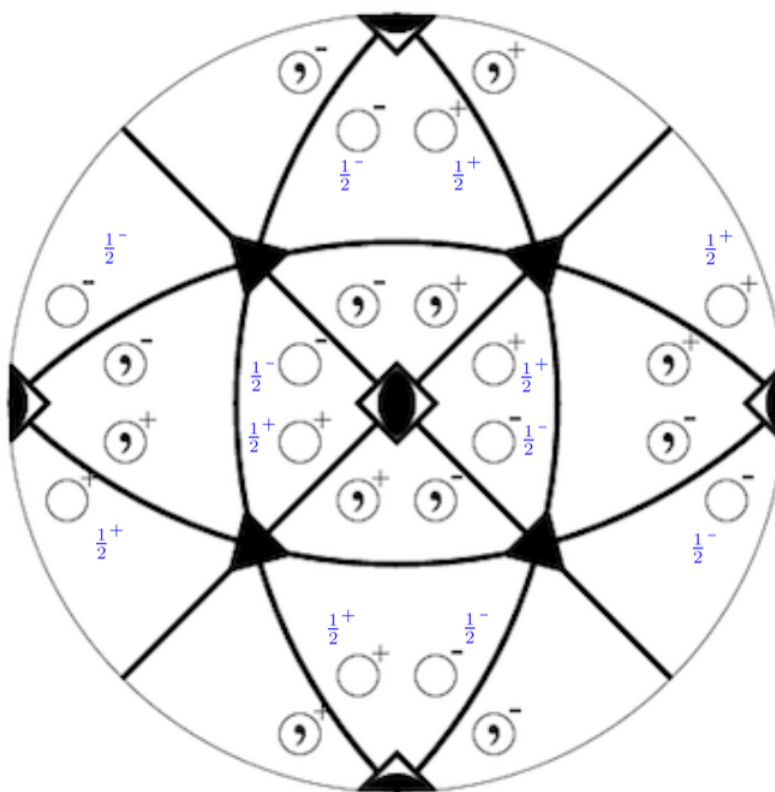
$\bar{4}3m$



31.2.104

23

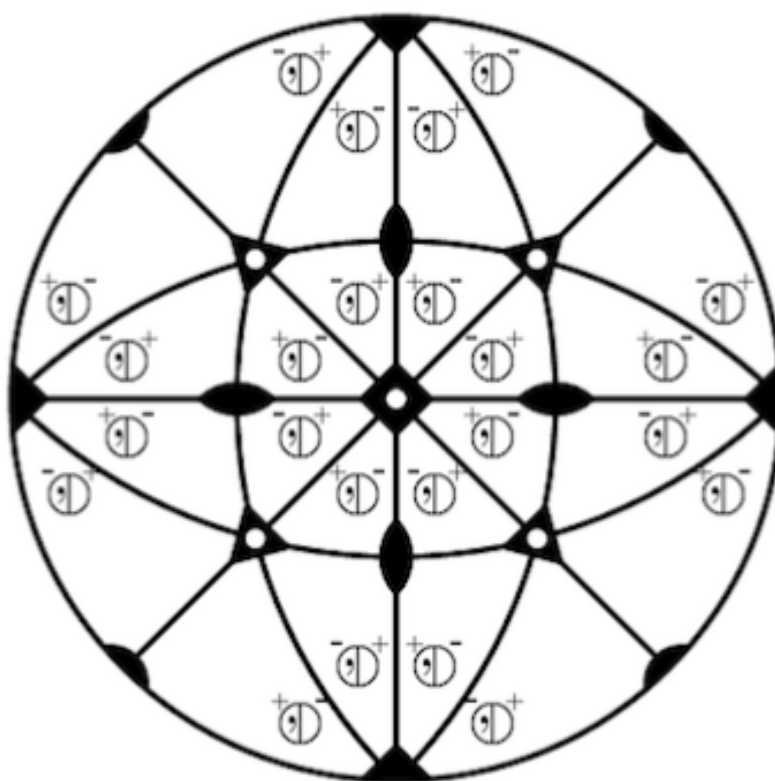
$\bar{4}3m$



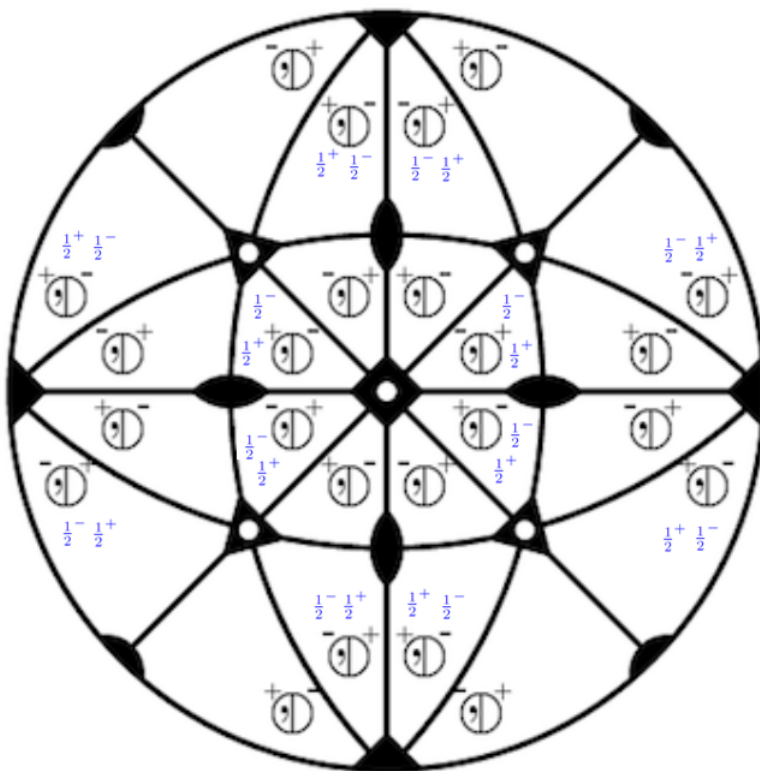
32.1.105

$m\bar{3}m$

$m\bar{3}m$



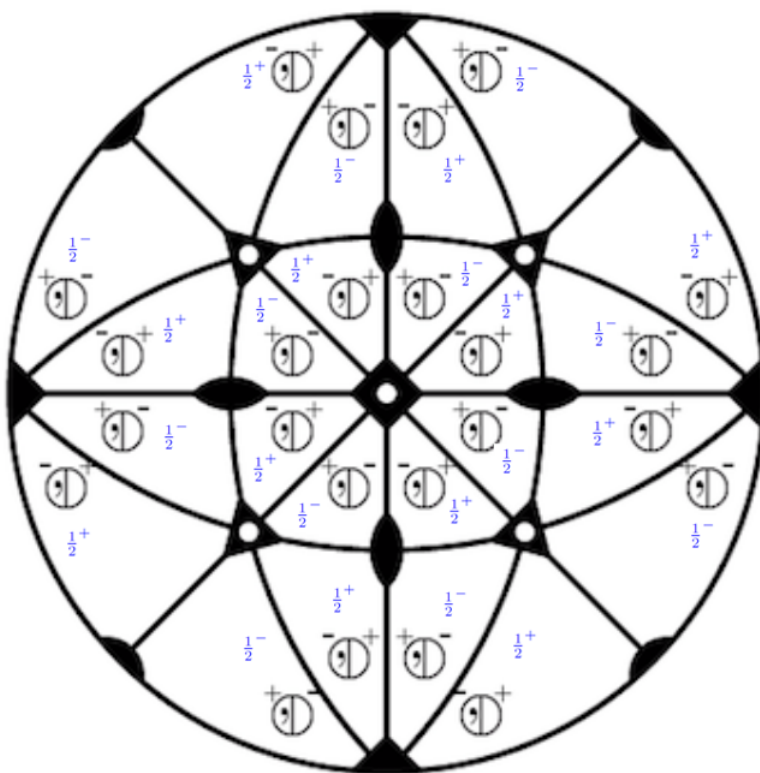
32.2.106

 $m\bar{3}$
$$\text{m}\bar{3}\text{m}$$


32.3.107

432

$m\bar{3}m$



32.4.108

43m

$m\bar{3}m$

