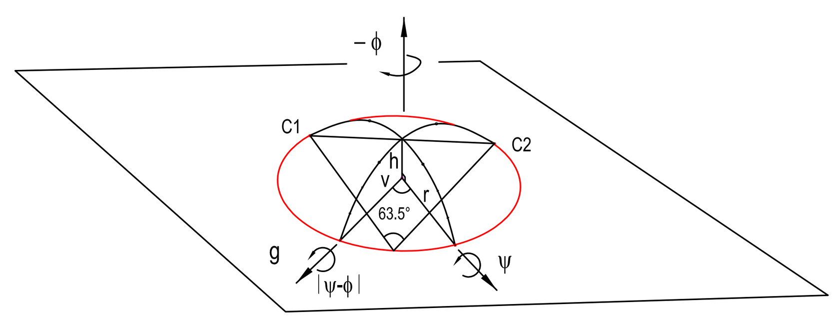
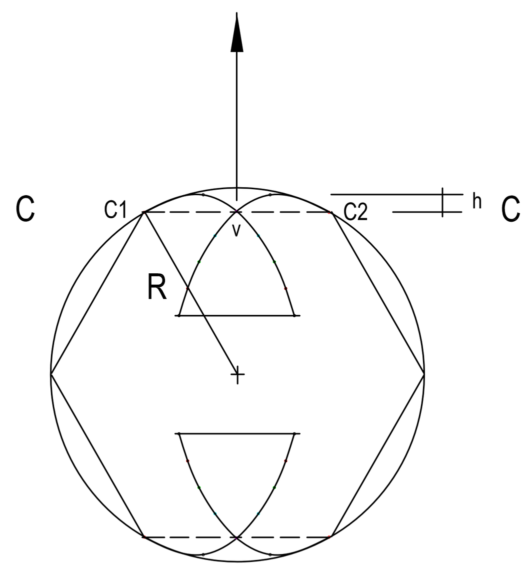
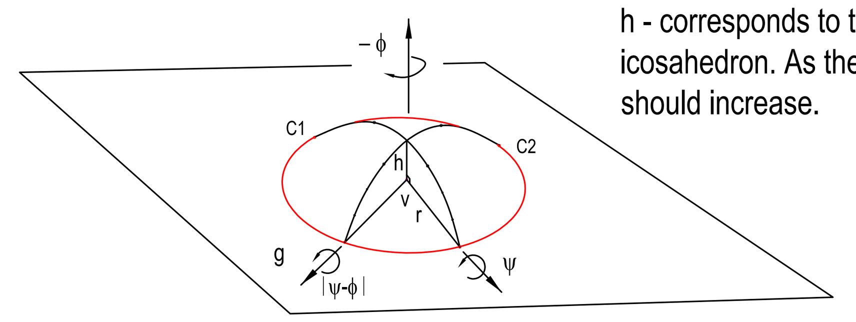
Energy flow out of surface





Energy flow out of surface

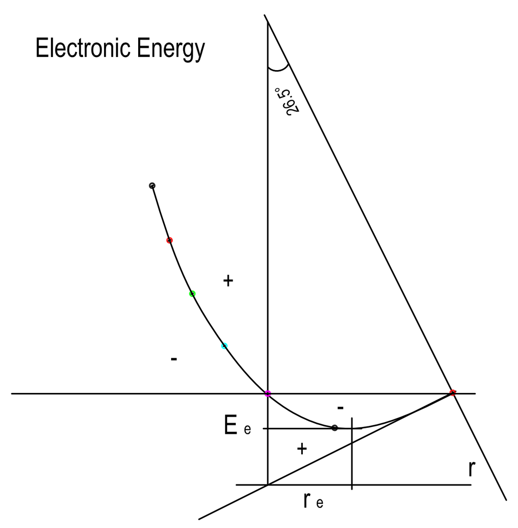


h - corresponds to that of the dodecahedron or icosahedron. As the to the framework is decreased, h should increase.

There are three edges to the triangle where the two curves C1 and C2 can form a vortex. For the icosahedron of 20 faces:
3 x 2 x 20 = 120 zones total.

Electronic Energy for 26.5°. Change the angle to 35 and re-plot

Electronic Energy



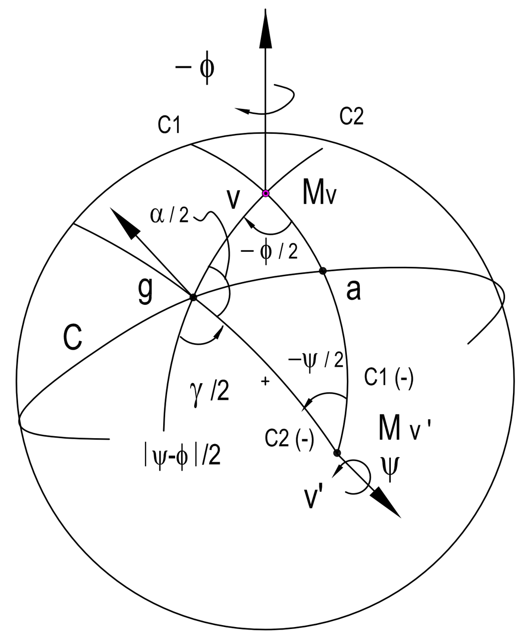
Revolve the curves C1 and C2 about the normal to the tangent plane.

From the vertex / singularity V find the height h to the surface of the sphere where this surface would be rotated to develop an inverted or upright vortex.

The 13 points can also be projected on the four planes of the tetrahedron for a total of 52 points. Here it is assumed the form is symmetric so that taking one edge would provide us with C1 and C2 and we can then calculate the energy transfer in and out from each face.

For the tetrahedron which is formed by the orthogonal coordinate system, all the dges are not equal. The edges forming the coordinates are equal and the edges foming the inclined surface are equal. Hence we have four curves, and the 13 points are not one and the same but there are in total 26 points, 13 of which correspond to C1 and C2, say for the coordinate edges and the second set of 13 that correspond to C3 and C4 making the edges of the inclined surface vgv'.

For the Octahedron with 8 symmetric faces and edges, we would have 13 x 8 = 104 points.



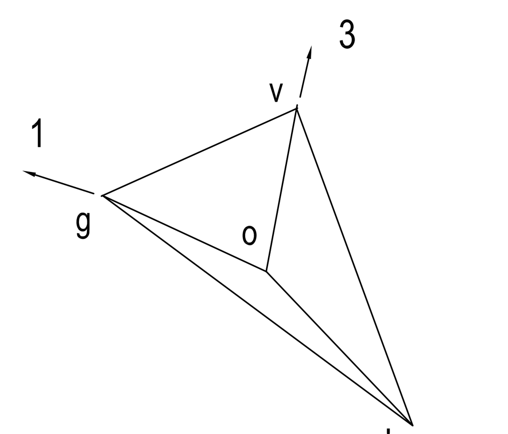


Figure -1

The Born-Oppenheimer Separation

Ref.: Spectroscopy & Structure, by Richard N. Dixon, Methuen & Co. London 1965

The complete quantum mechanical Hamiltonian for a molecule is too complex to use in its exact form. However, the concept of a molecule as possessing electronic, vibrational and rotational energy levels is quaite familiar. Born and Oppenheimer have shown that the terms that have to be neglected in order to separate the motion into these three types of motion are very small. This separation implies that the total molecular wavefunction may be written in the form:

$$\psi_{total} = \psi_e \cdot \psi_v \cdot \psi_r$$

and ψ_e , ψ_v , ψ_r are functions of independent coordinates. The electronic wave function ψ_e may be considered as the eigenfunction of a purely electronic Hamiltonian in which the nuclei are fixed.

The electronic energy will vary with internuclear arrangement and for each different electronic state (change of the angle) , the arrangement of the nuclei which gives a minimum value E_e for the electronic energy is known as the equilibrium configuration. In vibration, this electronic energy acts as a potential energy V for variation of internuclear distances, giving vibrational levels with energy Ev relative to Ee (ie, V=0)

In each vibrational level of each electronic state the molecule may be regarded as rotating with a moment of inertial which corresponds to an average geometrical structure.

The figure above illustrates this for a diatomic molecule. The model for the interpretation of rotational levels assumes that molecules are rigid bodies, and the total molecular enegy is then:

$$E_{total} = E_e + E_v + E_r$$

Relate the framework to Hamiltons 52 points / particles.

"Each plane contains fifty two points, namely three given points, four points of the first, and 45 points of second construction...." See Hamiltons Quaternions, pg. 81.

Model for the rotational and symmetric system with nine dimensions. For the irrotational system take the truss with seven polygons.

Take 9 polygons in the truss, to account for the nine dimensions
obtain the 7 particles and 7 antiparticles for each quadrant above and below the tangent plane
This provides us with 7 x 8 = 48 points

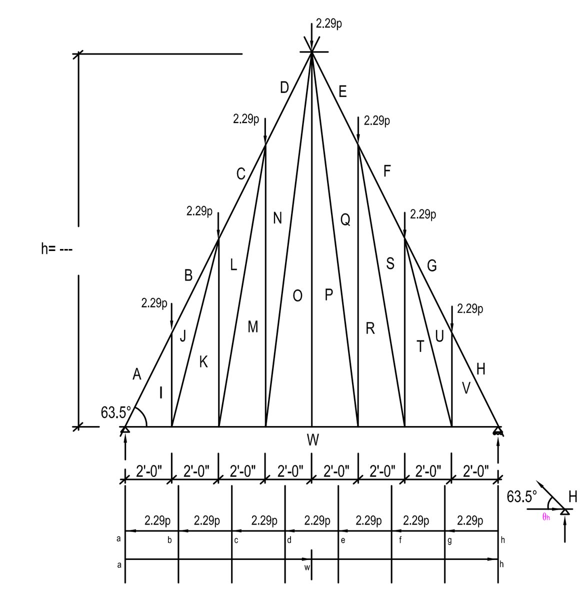
Take the origin at v which is a double root.

we have 3 points and 5 points for each curve C1 and C2 making up for a total of 8 points per curve.

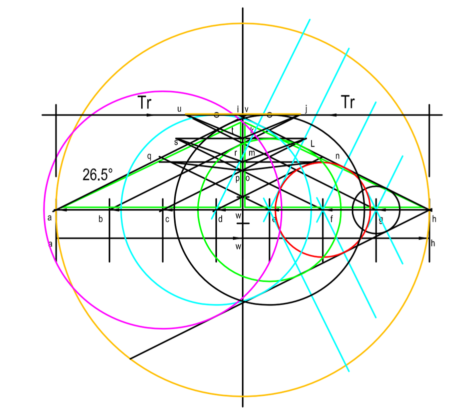
We have 14 points total on each side of the tangent plane. V at the origin is a double point, and hence at the singularity v should be counted once. Case where, $b^2 - ac < 0$.

Thus we have a total of 13 points.
13 x 4 = 52 points total.
Equation of the tangents to curves C1 & C2 are represented by:
$a x^2 + 2b xy + c y^2 = 0$

For the equation of the curves C1 & C2 see "Theory of Maxima and Minima" by Harris Hancock, Dover Publication, 1960. pg. 29.



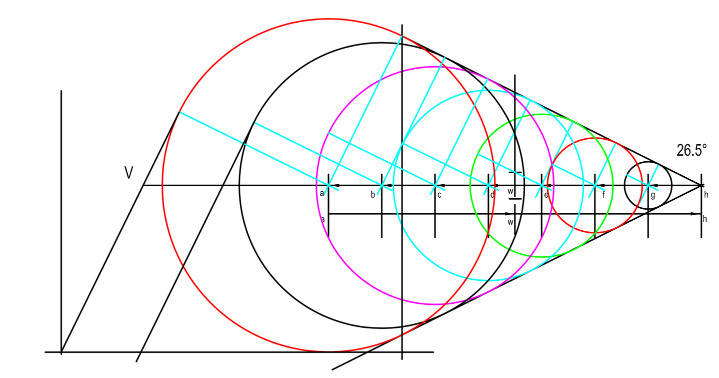
Truss - Framework for 7 polygons
Take 9 polygons for 9 dimensions



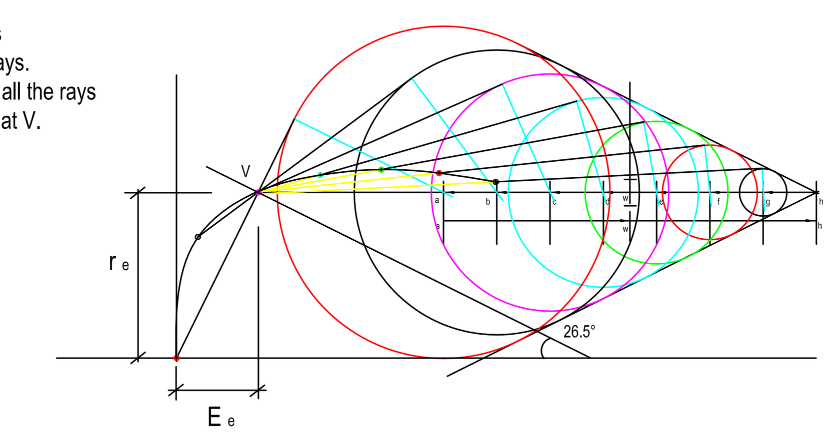
Force polygon for 7 polygons

Velocity Pole Curve of the conjugate hyperbola for a frame work with 9 polygons / dimensions

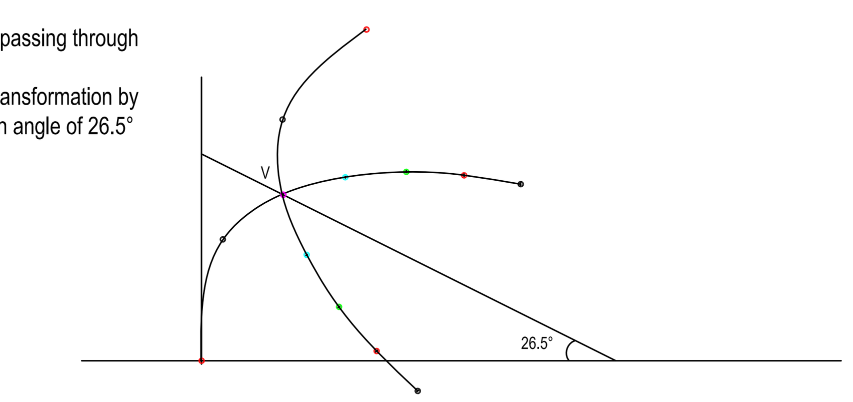
Draw the conjugate rays and the tangent to the rays.

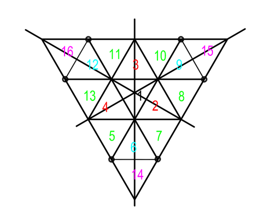


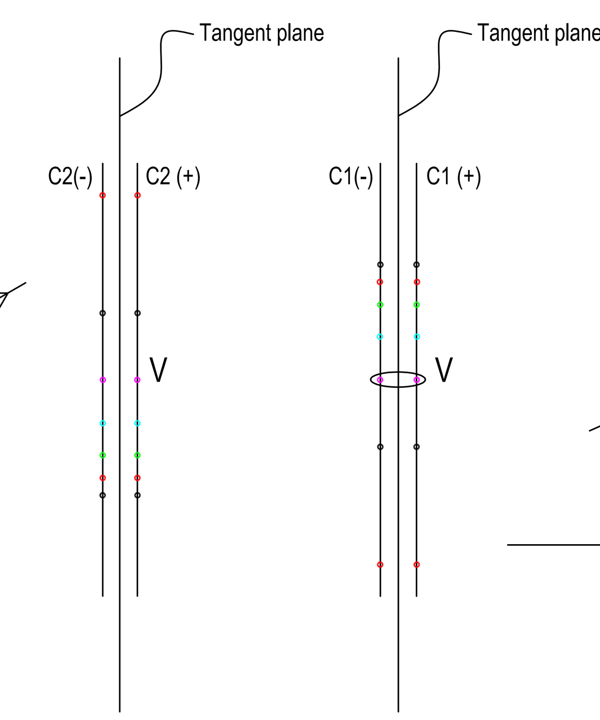
Draw the conjugate rays and the tangent to the rays.
Rotate the circle so that all the rays pass through the vertex at V.



Mirror about the axis passing through the vertex.
Perform coordinate transformation by rotating the axis by an angle of 26.5°







- Cross section - i-i
14 points above and below the tangent plane X-Y
At the origin, v is a double point and if counted once we have 13 points in total.
13 x 4 = 52 points total.
4 is taken for four quadrants