**Notations:**

δi := a constant for node i, 1 ≤ i ≤ n,

= 1, if i th node is a regenerator node

= 0, otherwise

Xijk := a binary variable for each edge i→j and for each segment k, such that

= 1, if k-th segment of the new lightpath uses the edge i→j

= 0, otherwise.

Yij(k, l) := a binary variable for each edge i→j, for each segment k and for each lightpath l, such that

= 1, if kth segment of the lth lightpath uses the edge i→j

= 0, otherwise.

s = maximum number of possible segments in a translucent lightpath

L = total number of lightpaths created so far

E := set of edges

**Objective function for the new ILP to minimize maximum number of regenerations at all regenerator nodes:**

Minimize: L∑l = 1 s∑k = 1 ∑(i,j) є E Yij(k, l) . δi

for all i where δi = 1

Let the optimal value(maximum regenerations at a regenerator node) obtained in the above ILP be f0 .

**Objective function for the new ILP to minimize total no of regenerations and in addition minimize maximum number of regenerations at all regenerator nodes:**

Minimize: s∑k = 1 ∑(i,j) є E Xijk . δi

subject to the constraints:

* L∑l = 1 s∑k = 1 ∑(i,j) є E Yij(k, l) . δi  = f0 , for all i such that δi = 1.

and also the other constraints mentioned in the paper.