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Finish the interpretation Algorithm 3, and adjust some parameters for the corresponding function

## Inner loop Algorithm

First of all we need to determine the maximum segments before we get,started with the algorithm, according to the piecewise function of EH model in the picuture below. So to get the maximum number of segments, we need to first figure out which segment of Pth which is the threshold power of PiR belongs to, by using the equation below, we can get the maximum value of the received power PiR then we need to compare it to the piecewise model and figureout the which segment it blongs to then we can get the maximum number of segemnts.

So first use the euqation to obtain the mamimum PiR:

1. Scan the Enabled SWIPT D2D links, set each segemnt's maximum value of received power to the array.

2. Then find the ponint where the received  power reches the maximum value among each segemnt's maximum value.

3. Then the corresponding maximum value among all of these "maximum value" will be used to compare to the piecewise model by traversing through the whole threshold power array , **but remember that the number of the segment in the linear piecewise Energy Harvesting model does not increase as the received increase, so at the end of the loop we should find maximum value of the N_segment array)**

Then we can start to implement the algorithm with my obtained maximum value of segments:Nmax.

1. First we start to traverse the whole SWIPT-Enabled D2D links,to get the optimal value of each sgement of SWIPT-Enabled D2D links.
2. Then to match every possible CUE link k, first scan every CUE in the Partner selection set Sid, as mentioned in the prematching Algorithm the Sid set should be a set for potential segments that can match the corresponding segement of the SWIPT-Enabled Gropu.
3. Then to scan each segement of every segemnt j in the piecewise EH model.
4. The reason why we need to use the iteration t is beacsue we dont solve lagrange multipliers directly by solving the Lagrange functions,instead we use the gradient method to solve them, so maybe at the beginning we not get very perfect lagrange multipliers so we need to iterate the process until we get relatively optimal values of all the Lagrange multipliers so that we can then use the optimal lagrange values to calculate corresponding power splittig ratio and transmission power of  D2D links at segment i.So this shall be like : There should be a temp value for storing each iteration of transmission power and power splitting ratio, and **at each iteration we need to check the condition if the calculated value of Throughput using current transmission power and current value of power splitting ratio is bigger than the product of current value of Q and energy consumption, it means that the value of lagrange multipliers we get is not optimal, so we still need to update the lagrange multipliers and update Q.Otherwise, assign the current iteration value of transmission power and power splitting ratio to that of segemnt j and i, and most importly, the current Q to energy efficiency EE.**
5. And at the end , we should get a relatively optimal array of EE, transmission power, power splitting ratio.