1073-05-51 **Jingfen Lan*** (a-za1107@163.com), 1907 Wheat St. Apt.B, Columbia, SC 29205, and **Linyuan Lu** (lu@math.sc.edu) and **Lingsheng Shi** (lshi@math.tsinghua.edu.cn). *Graphs with Diameter n-e Minimizing the Spectral Radius.*

For a fixed integer $e \geq 1$, let $G^{min}_{n,n-e}$ be a graph with minimal spectral radius among all connected graphs on n vertices with diameter $n-e$. For $e = 1, 2, 3, 4, 5$, $G^{min}_{n,n-e}$ were determined before. Then Cioabă-van Dam-Koolen-Lee conjectured for fixed $e \geq 6$ that $G^{min}_{n,n-e}$ is in the family $\P_{n,e} = \{P^{2,m_2,\ldots,m_{e-4},n-e-2}_{2,1,\ldots 1,2,n-e+1} \mid 2 < m_2 < \cdots < m_{e-4} < n-e-2\}$. We settle their conjecture positively here.

Let $T_{(k_1,k_2,\ldots,k_{e-4})} = P^{2,m_2,\ldots,m_{e-4},n-e-2}_{2,1,\ldots 1,2,n-e+1}$ with $k_i = m_{i+1} - m_i - 1$, for $1 \leq i \leq e-4$, here $m_1 = 2$ and $m_{e-3} = n-e-2$. Let $s = \frac{n-6}{e-4} - 2 = \frac{\sum_{i=1}^{e-4} k_i + 2}{e-4}$. For $e \geq 6$ and sufficiently large n, we proved that $G^{min}_{n,n-e}$ must be one of the trees $T_{(k_1,k_2,\ldots,k_{e-4})}$ with the parameters satisfying $\lfloor s \rfloor - 1 \leq k_j \leq \lfloor s \rfloor \leq k_i \leq \lceil s \rceil + 1$ and $0 \leq k_i - k_j \leq 2$ for $j = 1, e-4$ and $i = 2, \ldots, e-5$; $|k_i - k_j| \leq 1$ for $2 \leq i, j \leq e-5$. These results are best possible as shown by cases $e = 6, 7, 8$, where $G^{min}_{n,n-e}$ are completely determined. Moreover, if $n-6$ is divisible by $e-4$ and n is sufficiently large, then $G^{min}_{n,e} = T_{(s-1,s,s,\ldots,s,s-1)}$. (Received July 21, 2011)