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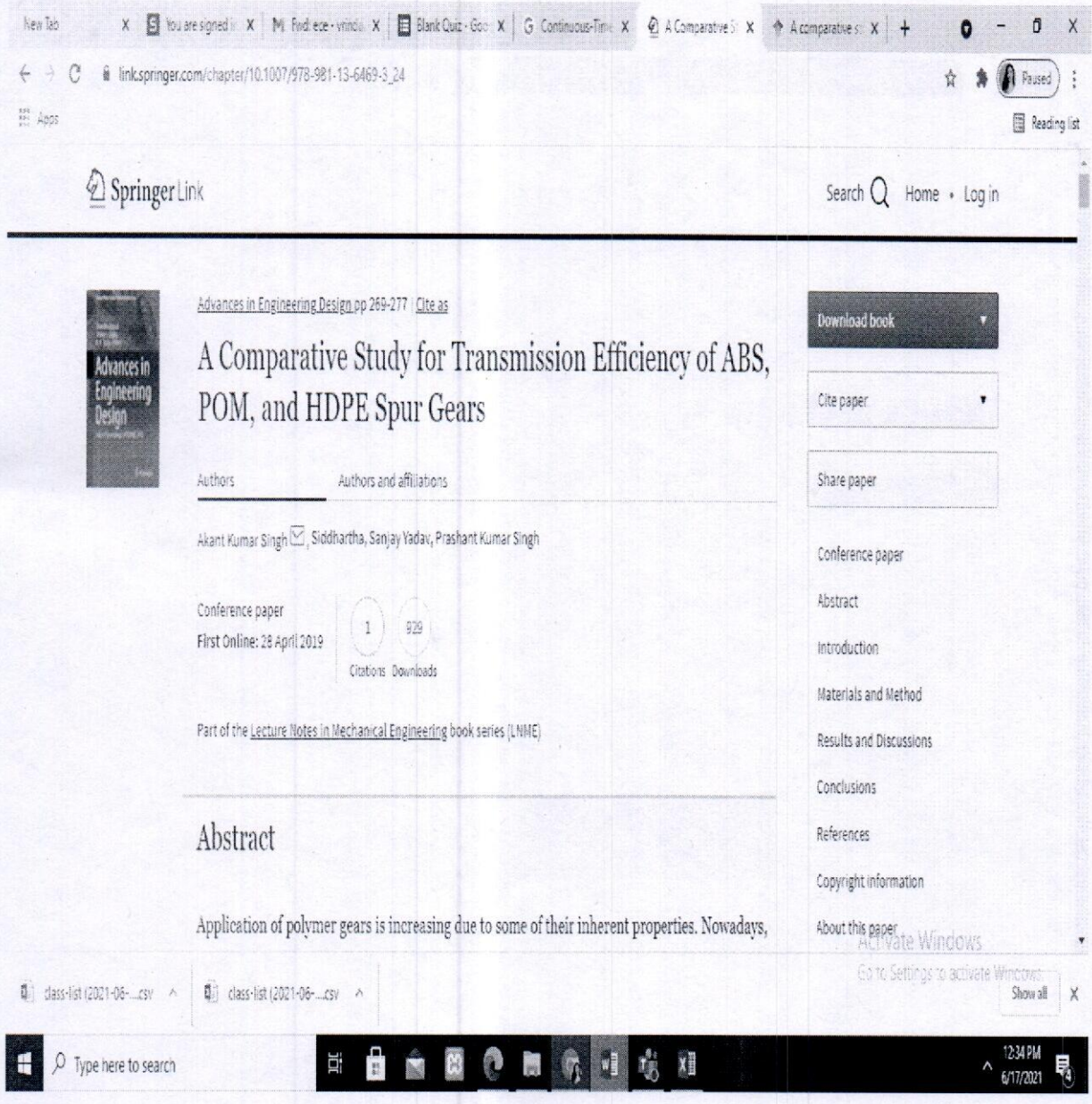

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A Comparative Study for Transmission Efficiency of ABS, POM, and HDPE Spur Gears

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Akant Kumar Singh ✉, Siddhartha, Sanjay Yadav, Prashant Kumar Singh

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Abstract

Application of polymer gears is increasing due to some of their inherent properties. Nowadays,

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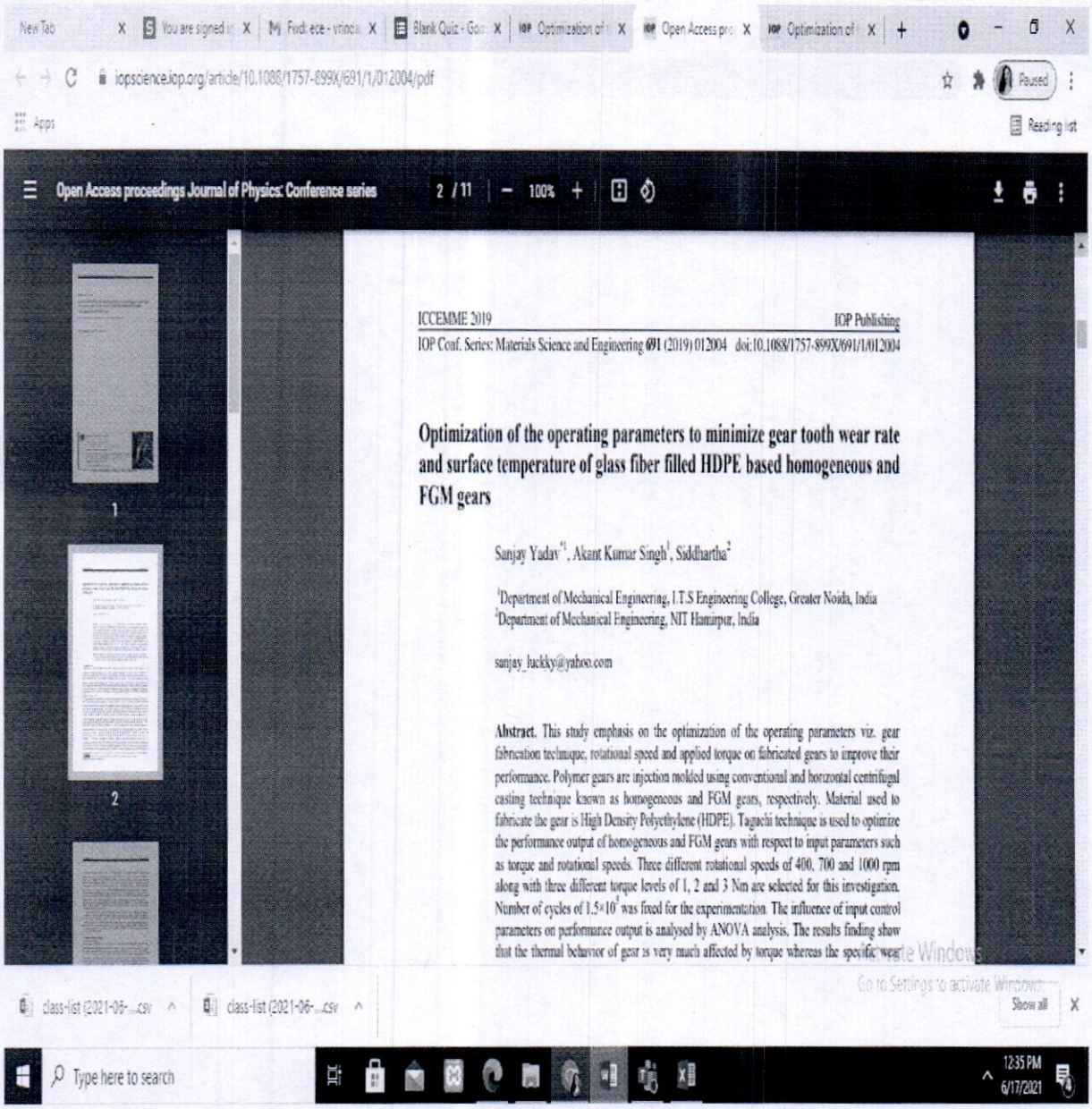

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Optimization of the operating parameters to minimize gear tooth wear rate and surface temperature of glass fiber filled HDPE based homogeneous and FGM gears

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Abstract. This study emphasis on the optimization of the operating parameters viz. gear fabrication technique, rotational speed and applied torque on fabricated gears to improve their performance. Polymer gears are injection molded using conventional and horizontal centrifugal casting technique known as homogeneous and FGM gears, respectively. Material used to fabricate the gear is High Density Polyethylene (HDPE). Taguchi technique is used to optimize the performance output of homogeneous and FGM gears with respect to input parameters such as torque and rotational speeds. Three different rotational speeds of 400, 700 and 1000 rpm along with three different torque levels of 1, 2 and 3 Nm are selected for this investigation. Number of cycles of 1.5×10^5 was fixed for the experimentation. The influence of input control parameters on performance output is analysed by ANOVA analysis. The results finding show that the thermal behavior of gear is very much affected by torque whereas the specific wear

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Contents

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Abstract:

Nanotechnologies are providing a new set of tools to the branch of engineering for producingvarious equipments in a scale ranging from one to a few hundred nanometers. Nano-networks will expand the capabilities of single nano-devices by providing them a way to cooperate and share information. Exchange of information via nano devices is called “Nano Communication (NC)”. In this paper, Mat’ern Hard-Core Process (MHCP) has been presented to mitigate the interference. First of all, we have reproduced the results of base paper. Thereafter, we have presented similar analytical model using MHCP Type 2. It is worthy to mention that for NC system MHCP is most regular spatial distribution. The analytical expressions have been validated through numerical comparison with the results available in [1] in which Diffusion based molecular nano-networks use the Poisson Point Process(PPP) to define the random distribution of transmitters and receivers in either a two dimensional or a three dimensional space. However, NC is prone to high level of interference among the transmitting nano-machines that causes loss of information. The numerical simulation has been presented here.

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