

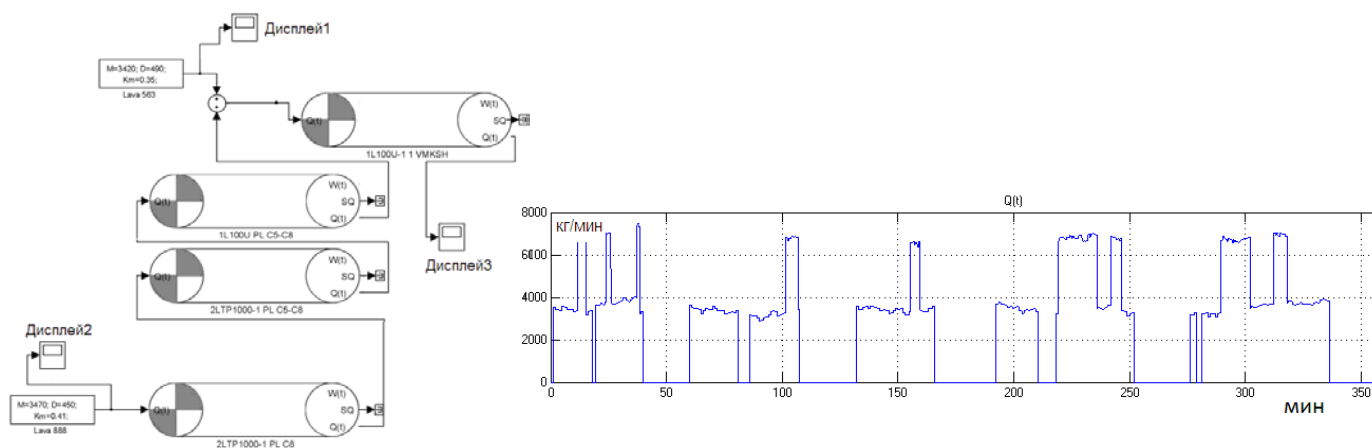
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Simulation of Mine Conveyor Network

It is known that in the conditions of overall introduction of conveyers for delivery at coal faces, certain conveyers in mines, including the Western Donbass, work at irregular load and therefore overloaded by 2-5 times of specific consumption of electricity, which is not efficient. We can eliminate this disadvantage by using controlled drive. However, its use in these installations is still at the level of pilot projects and is hampered by the lack of evidence of its effectiveness, including the difficulty and complexity of obtaining observed data for the study.

The most important stage in this task is modeling flows of coal production faces and evaluating performance of mass flow of conveyor transport, as it helps define energy efficiency of facilities, including a fitted adjustable drive.

Simulations are conducted in the mathematical environment of SIMULINK MATLAB. An integrated model of the transport scheme is divided into basic objects modeling: longwalls characterized by output of freight traffic at each moment of time; flights of the main conveyor, characterized by belt rate, the output load flow, loading capacity, active energy consumption, averaging from feeder bins characterized by initial freight traffic and the level of loading. Each of these objects required development of its own generic algorithm of its parameters at a time to unite in actual or typical schemes of mine conveyor transport network, which will solve the issues of energy efficiency of new or reconstructed transport scheme and make recommendations on the need for the use of energy efficiency measures.



To sum up, simulation offers the opportunity to evaluate the real-time energy efficiency of pipelines and processes to manage the transportation of coal, including the maximum energy efficiency, for example by means of controlled drive.