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АНАЛИЗ И МОДЕЛИРОВАНИЕ АВТОНОМНОЙ ФОТОЭЛЕКТРИЧЕСКОЙ СИСТЕМЫ С ИСПОЛЬЗОВАНИЕМ СРЕДЫ MATLAB/SIMULINK

Абдали Л.М.¹, Исса Х.А.², Али К.А.³, Кувшинов В.В.⁴, Бекиров Э.А.⁵

- *ФГАОУ ВО «Севастопольский государственный университет», Институт вдерной энергия и промышленности, г. Севастополь, РФ, laith 2210@yahoo.com
- ²ФГАОУ ВО «Севастопольский государственный университет», Институт вдерной энергии и промышленности, г. Севастополь, РФ , haeder.issa84@gmail.com
 - ³ФГАОУ ВО «Санкт-Петербургский политехнический университет Петра Великого» Институт энергетики, г. Санкт-Петербург, РФ, qaysadnanali153@gmail.com
- 4Ф€АОУ ВО «Севастопольский государственный университет», Институт вдерной энергии и промышленности, г. Севастополь, РФ, 299015, впуshinov.yladimin@gmail.com
 - ⁵ФГАОУ ВО «Крымский федеральный университет им. Вериадского», Филико-технический институт, г. Симфевополь. РФ, bekirov.e adirefuv.ru

Авинотация: Использование возобновляемых источников энергии и, в частности, солнечной энергии привлекло значительное внимание в последние десятилетия. Проекты по производству фотоэлектрической (PV) энергии реализуются в очень большом количестве во многих странах. Многие исследовательские работы проводятся для анализа и проверки производительности фотоэлектрическог модулей. Реализация экспериментальной установки для фотоэлектрической энергосистемы с преобразователем постоянного тока для проверки производительности системы не всегда возможна изза практических ограничений. Программиза имитационная модель помогает анализировать производительность фотоголектрических модулей, и более полезной будет общая схемная модель, которую можно использовать для провеског любого коммерческого фотоэлектрического модуля .В данной работе представлено моделирование математической модели фотоэлектрического модуля, повышающего преобразователя постоянного тока в переменный, а также было проведено моделирование режимов работы солнечной генерирующей системы при различных нагрузочных характеристиках. Модель, представленная в этой статье, может использоваться как обобщенный фотоэлектрический модуль для авализа производительности любых коммерчески доступных фотоэлектрических модулей. В представленной работе исследовались параметры, которые влияют на производительность генерирующей системы. Результаты получены для работы фотоэлектрических преобразователей постоянного тока в переменный. Представленные характеристики сильно зависят от таких параметров, как солисчиая инсолиция, температура рабочей поверхности фотоэлектрического модуля, время заряда-разряда аккумуляторных батарей и др. При изменении одного из значений этих параметров меняются режимы работы солнечной электрогенерирующей батарен. Изменение режимов работы может приводит к сбоям воей работы системы, поотому необходим контроль всех эксргетических характеристик установки. Достичь повышения эффективности генерации системы способны предложенные и этой работе действия, направленные на изучение работы фотоэлектрической системы и системы накопления энергии, а также использование необходимых вспомогательных устройств для контроля и управления параметрами установки. Исследования, проведенные в коде представленной работы, позволяют повысить уровень знаний по контролю и управлению параметрами фотоэлектрических генерирующих установок и расширить возможности их бесперебойной работы и увеличения энерговыработки.

Предмет исследования. Предмет исследования. Анализа и проверки производительности фотохлектрические модули. Магериалы и методы. В работе были проведены Реализации экспериментальной установкия для фотохлектрической эксргосистемы с преобразователем постоянного тока для проверки производительности системы и исследования действующей компьютерного моделирования параметров интегрированной системой солнечной генерации фотохлектрическими с использованием программной среды Matlab, а также методы теоретического анализа, митематическое и статистические методы, программной среды материалов исследования.

Регультаты, оптимилировать работу фотохлектрических систем и повысить их эффективность.

Выводы. По результатам можно сделать заключение об увеличении эффективности работы соднечных установок с подобавым библиотекам блоков Simulink, что делает её легко моделируемой и авализируемой в сочетании с силовой электроникой для работы системы с максимадыной мощностью. Принимая во внимание влияние солнечного издучения и температуры вчейки на выходной ток и мощностные характеристики модулями при помощи предложенной модели возможно инэчительно увеличить эффективность работы всей установым.

Ключевые слова: Автономная фотоэлектрическая система, программа Matlab/Simulink, фотоэлектрическае панели, аккумлирующая батаров, контроллер, нагрузка, температура, энергопроизводительность системы, солие-ная генерирующая установка.

Michael Brown

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