

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

# الآیة

اللَّهُ نُورُ السَّمَاوَاتِ وَالْأَرْضِ مَثَلُ نُورِهِ كَمِشْكَاةٍ فِيهَا  
مِصْبَاحٌ الْمِصْبَاحُ فِي زُجَاجَةٍ الزُّجَاجَةُ كَأَنَّهَا كَوْكَبٌ دُرِّيٌّ  
يُوقَدُ مِنْ شَجَرَةٍ مُّبَارَكَةٍ زَيْتُونَةٍ لَا شَرْقِيَّةٍ وَلَا غَرْبِيَّةٍ يَكَادُ  
زَيْتُهَا يُضِيءُ وَلَوْ لَمْ تَمْسَسْهُ نَارٌ نُورٌ عَلَى نُورٍ يَهْدِي اللَّهُ  
لِنُورِهِ مَنْ يَشَاءُ وَيَضْرِبُ اللَّهُ الْأَمْثَالَ لِلنَّاسِ وَاللَّهُ بِكُلِّ  
شَيْءٍ عَلِيمٌ

صدق الله العظيم  
(سورة النور الآية 35)

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To whom she dressed me the Life,

Mother

To Whom He gave me a beautiful Pain,

Father

The Suns that burn to light for us,

To the Teachers

To whom I share with them the sorrow and sweet,

Friends

Whenever commit a fault we will find forgiveness,

To brothers

To whom I stop for them,

To all

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The first thanks to Allah for help in completing this project, at second our thanks go to the almighty without help none of this could have been done.

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**Abstract:**

The aim of Sudan-Ethiopia electrical power interchange is to make use of the surplus water for hydro-generation in Ethiopia and to reduce the thermal generation in Sudan. In order to achieve this aim mentioned above, it requires

that the interconnected transmission line between the two countries should be more stable and reliable.

The transmission interconnection line parameters are calculated by using MATLAB program. By using these parameters the rating of static var compensator (SVC) is found, This can be installed through interconnection transmission line to compensate the receiving end open circuit voltage to the specified level (220 KV) at Gadaref Substation.

A mathematical model is made based on this idea, and a computer program is employed, to get the results which are analyzed.

Finally, a conclusion is made.

## **المستخلص:**

إن من أهداف تبادل الطاقة الكهربائية بين السودان وأثيوبيا هي إستغلال المياه للتوليد المائي في أثيوبيا لتقليل إستخدام التوليد الحرارى فى السودان.

ولكى يتحقق هذا الهدف المشار إليه أعلاه, فإن ذلك يتطلب أن يكون خط الربط الكهربائي بين البلدين أكثر إستقرارية وموثوقية. وإن عناصر خط النقل الرابط تم حسابها بإستخدام برنامج الماتلاب. وإستخداماً لهذه العناصر فإن معدل معوض القدرة الردفعية الإستاتيكي قد تم إيجاده الذى يمكن تركيبه عبر خط النقل الرابط الكهربائي ليعادل الفولتية المستلمة للمستوى المطلوب (220 ك ف) فى نهاية الدائرة المفتوحة فى محطة القصارف التحويلية.

النموذج الرياضى قد وضع إعتماًداً على هذه الفكرة, وكذلك إستخدم برنامج الحاسوب المعد ليعطى النتائج المحللة علمياً.

.وختاماً, قدمت الخاتمة

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## **List of abbreviations**

EELPA	Ethiopian Electric light and power authority
EEPCO	Ethiopian Electric Power Corporation
FINNIDA	Finnish International Development Agency
NEC	National Electricity Corporation
SETCO	Sudanese Electricity Transmission Company
ENTRO	Eastern Nile Technical Regional Office
ESIA/RAP	Environmental and Social Impact Assessment/ Resettlement Action Plan